

ARC FUSION SPLICER

INSTRUCTION MANUAL



SpliceMate™
Mass Fiber Splice Type

**Read this instruction manual carefully
before operating the equipment.**

**Adhere to all safety instructions and
warnings contained in this manual.**

Keep this manual in a safe place.

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The *SpliceMateTM* has been designed for splicing Silica-based optical fibers for telecommunications. Do not attempt to use this machine for other applications. Misuse of the machine may result in electric shock, fire and/or serious injury.

Follow all safety instructions

Read and understand all safety instructions.

Discontinue use if malfunctioning

Ask our service centers for repair as soon as possible.

Instruction Manual

Read this instruction manual carefully before operating this machine.

Store this instruction manual in a safe place.

The following alert symbols are used in this instruction manual and machine to indicate warnings and caution for safe use. Understand the meanings of these symbols.



WARNING

There is a possibility of death or serious injury resulting from improper use by ignoring this indication.



CAUTION

There is a possibility of personal injury or physical loss resulting from improper use by ignoring this indication.



Symbol means "Pay attention"



Pay attention to hot surface!



Symbol means "Must not do"



You must not disassemble!



Symbol means "Must do"



You must disconnect a plug!

Warning and Caution

WARNINGS

Disconnect the AC power cord from the AC adapter inlet or the wall socket (outlet) immediately if user observes the following or if the splicer receives the following faults:

-  Fumes, bad smell, noise, or over-heating occurs.
-  Liquid or foreign matter falls into cabinet.
-  Splicer is damaged or dropped.

If any of these faults occurs, ask our service center for repair. Leaving the splicer in a damaged state may cause equipment failure, electric shock, or fire and may result in injury or death.



Use only the AC adapter (ADC-10) designed for this splicer. Using an improper AC power source may cause fuming, electric shock or equipment damage and may result in injury, death, or fire.

- Proper AC power source is AC100-240V, 50-60Hz. Check the AC power source before use.
- AC generators commonly produce abnormally high AC output voltage or irregular frequencies. Measure the output AC voltage with a circuit tester before  nnecting the AC power cord. Such abnormally high voltage or frequency from a generator may cause fuming, electric shock, or equipment damage and may result in injury, death or fire. Make sure the generator is regularly checked and serviced.



Use the supplied AC power cord. Do not place heavy objects on the AC power cord. Use of an improper cord or a damaged cord may cause fuming, electric shock, or equipment damage and may result in injury, death, or fire.



Do not disassemble or modify the splicer, AC adapter, battery, or DC adapter. In particular, do not remove or bypass any electrical or mechanical device (e.g. a fuse or safety switch) incorporated into the design and manufacture of this equipment. Modification could cause damage that may result in injury, death, electric shock, or fire.



Never operate the splicer in an environment where flammable liquids or vapors exist. Risk of dangerous fire or explosion could result from the splicer's electrical arc in such an environment.



Do not use compressed gas or canned air to clean the splicer. They may contain flammable materials that could ignite during the electrical discharge.



Do not touch the electrodes when the splicer is on and power is supplied to the unit. The electrodes generate high voltage and high temperatures that may cause a severe shock or burn.

Note Arc discharge stops when the wind protector is opened. Turn the splicer off and disconnect the AC power cord or remove batteries before replacing electrodes.

 WARNINGS	
	Safety glasses should always be worn during fiber preparation and splicing operation. Fiber fragments can be extremely dangerous if they come into contact with the eye, skin, or are ingested.
	Properly connect the AC power cord to the splicer (inlet) and wall socket (outlet). When inserting the AC plug, make sure there is no dust or dirt on the terminals. Engage by pressing the female plug into the splicer (inlet) and the male plug into the wall socket (outlet) until both plugs are fully seated. Incomplete engagement may cause fuming, electric shock, or equipment damage and may result in injury, death, or fire.
	Do not short-circuit the terminals of AC adapter (ADC-10), optional battery (BTR-07), or DC adapter(DCA-02). Excessive electrical current may cause injury due to fumes, electric shock, and equipment damage.
	Do not touch the splicer, AC power cord, and AC plugs with wet hands. This may result in electric shock.
	Do not operate splicer near hot objects, in hot temperature environments, in dusty / humid atmospheres, or when water-condensation is present on the splicer. This may result in electric shock, splicer malfunction, or poor splicing performance.
	When using optional battery (BTR-07), follow the instructions below: Failure to follow these may result in explosion or injury. • Do not charge battery with methods other than instructed. • Do not discard battery into an incinerator or fire. • Do not charge or discharge battery near a flame or under direct sunlight. • Do not excessively shake or jar the battery. • If battery leaks liquid residue, handle carefully so the liquid does not contact skin or eyes. If contact occurs, immediately wash affected area thoroughly and see a doctor. Dispose of the battery and call the service center for a replacement. • Do not stack battery on top of AC adapter while charging. • If charge did not complete in three hours or the "CHARGE" LED does not turn ON, immediately stop charging and call the service center for repair.
	When transporting the carrying case using the shoulder belt, check the belt and hooks for damage before use. Carrying the case with a damaged shoulder belt may cause the belt to break or come off and result in injury or equipment damage.

Warning and Caution

 CAUTIONS	
	Do not store splicer in any area where temperature and humidity are extremely high. Possible equipment failure may result.
 	Do not touch protection sleeve or tube-heater during heating or immediately after completion of heating. These surfaces are very hot and touching may result in burns.
	Do not place the splicer in an unstable or unbalanced position. The splicer may shift or lose balance, causing the unit to fall. Possible injury or equipment damage may result.
	The splicer is precision adjusted and aligned. Do not allow the unit to receive a strong shock or impact. Possible equipment failure may result. Use supplied carrying case for transportation and storage. The carrying case protects the splicer from damage, moisture, vibration, and shock during storage and transportation.
	Follow the below listed instructions for handling electrodes: • Use only specified electrodes. • Set the new electrodes in the correct position. • Replace the electrodes as a pair. Failure to follow the above instructions may cause abnormal arc discharge, resulting in equipment damage or degradation in splicing performance.
	Do not use any chemical other than pure alcohol (99% or greater) to clean the objective lens, V-groove, LEDs, LCD monitor, etc., of the splicer. Otherwise blurring, discoloration, damage, or deterioration may result.
	The splicer requires no lubrication. Oil or grease may degrade the splicing performance and damage the splicer.
	The equipment must be repaired or adjusted by an authorized technician or engineer. Unauthorized repair may result in fire or electric shock. Should any problems arise, please contact your nearest sales agency.

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Introduction

The *SpliceMate*TM with PAS technology is designed for splicing a variety of optical fiber ribbons and single fibers. Its small size and light weight make it suitable for any operating environment. It is easy to operate and splices quickly while maintaining low splice loss. In order to achieve the splicer's full capabilities, read the following important information.

Splicer Name : Splice Mate Model Name : FSM-11R
--

Splice modes

In addition to standard splice modes, the *SpliceMate*TM also has 5 automatic modes, [AUTO], [SM AUTO], [NZ AUTO], [DS AUTO], and [MM AUTO]. The AUTO modes are available for single fiber and up to 4 fiber ribbons.

When using an AUTO mode, the splicer counts the number of fibers and selects the adequate splice condition automatically. Moreover, the automatic arc calibration function is enabled when using AUTO mode.

The standard modes consists of [SM] for SMF (ITU-T G652), [NZ] for NZDSF (ITU-T G655), [DS] for DSF (ITU-T G653), and [MM] for MMF (ITU-T G651).

Automatic arc calibration function

This function calibrates the arc power during every splice. When the automatic arc calibration function is enabled, performing the [Arc calibration] function before a splice operation is not necessary. The automatic arc calibration function works in AUTO modes only. When using standard splice modes, performing [Arc calibration] before splicing is strongly recommended.

Useful functions

Change of operating direction

The *SpliceMate*TM has the ability to operate when the monitor is in the front or rear of the splicer. The figure to the right shows the operation when the monitor is positioned to the rear. To change the monitor position, refer to “Change of Operating Direction” on page 51.



Notes

LCD (Liquid Crystal Display) monitor

The *SpliceMate*TM is equipped with a LCD monitor, manufactured in a quality-controlled factory environment. However, some black dots may appear, or red/blue/green dots may remain on the screen. The screen brightness may not appear uniform, depending on viewing angle. Note that these symptoms are not defects, but are natural on LCDs.

Recycling

To recycle this product, disassemble it first, sort each part separately by material components, and follow your local recycling and disposal regulations.

Related patents of *SpliceMate*TM (FSM-11R)

US Patent No.

4978201

EPC No.

320978, 326988

Canada Patent No.

1309773

Description of Products

1. Splicer and Accessories

Arc Fusion Splicer
[FSM-11R]



AC Adapter
[ADC-10]



AC Power Cord



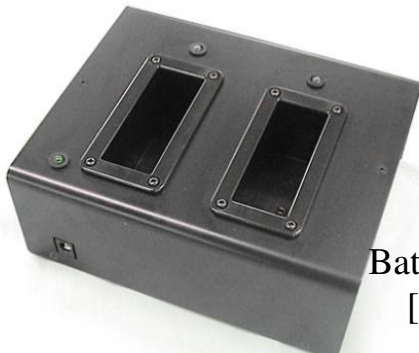
Spare Electrodes
1 pair
[ELCT2-12]



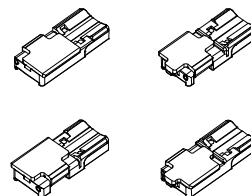
Battery Pack
[BTR-07]



DC Adapter
[DCA-02]
(OPTION)



Battery Charger
[DCA-02]

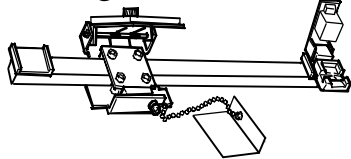
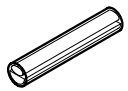
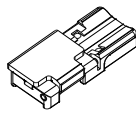
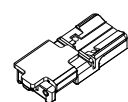
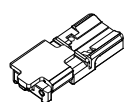
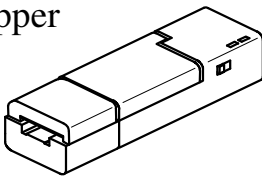
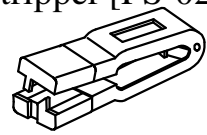
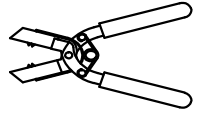
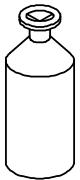


Fiber Holder
[FH-50-#]
(OPTION)

Other Attached Items

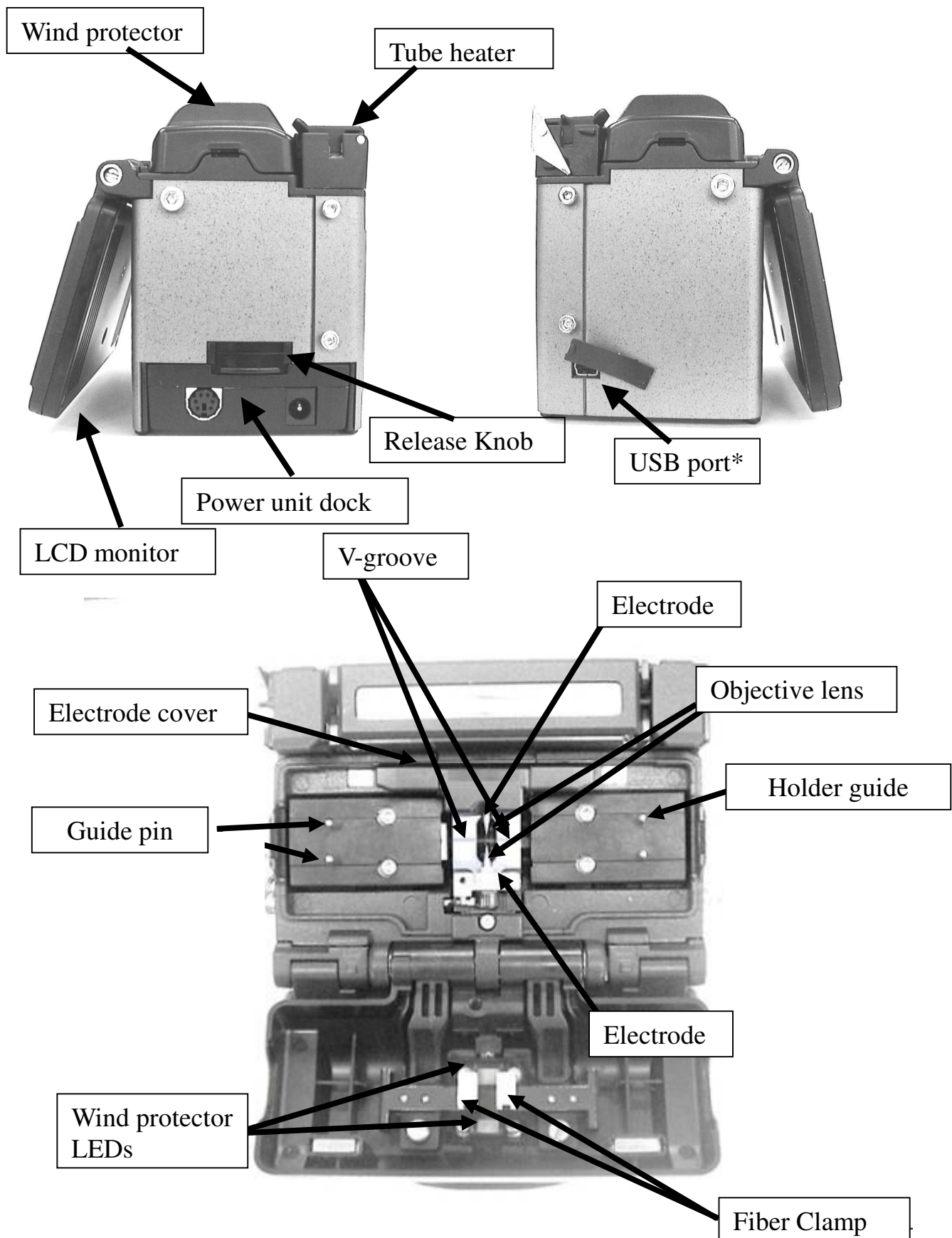
- Carrying Case [CC-17]
- Instruction Manual

2. Other Necessary Items for Splicing Operation

Fiber type	2, 4 Fiber ribbon Ribbon Thickness 0.25 - 0.4mm 	Single fiber UV 250um 	Single fiber Ny 900um 
	2, 4 Arranged single fiber 		
	Fiber arrangement tool [FAT-04] 		
Fiber protection sleeves	40mm (up to 8 fibers) [FP-04(T)] 	60mm [FP-03] 	40mm [FP-03 (L=40)] 
Fiber holders	[FH-50-2, -4] 	[FH-50-250] 	[FH-50-900] 
Fiber stripping tools	Hot Jacket Stripper [HJS-02] [HJS-03] 	Primary coat stripper [PS-02] 	Jacket stripper [JS-01] 
Fiber cleaving tool	Fiber Cleaver [CT-30A] 		
Fiber cleaning tools	Alcohol dispenser with alcohol (purity > 99%) 	Lint-free tissue or gauze or gauze 	

Description of Products

3. Splicer Description and Functions



* The USB port is mainly used for upgrading the software. Disconnect the USB cable before starting the splice operation.

4. key function



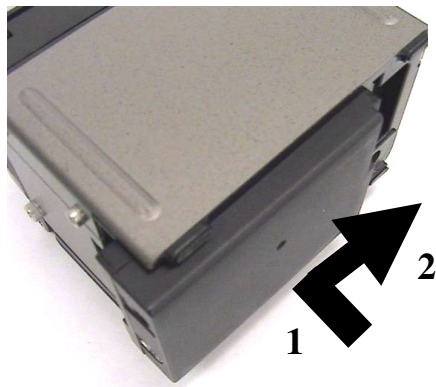
Mark/ Name	Description
 Power	To turn on/off the power.
 Up/Down	To adjust the brightness of the monitor screen at the ready state. these arrows are used to move the cursor for selecting the items at the menu state, or to change the value or letter of the discharge conditions and comments. During manual motor control, these arrows serve as the "Backward" and "Forward" keys to operate the motors.
 Heat	To start the heating process by the tube heater. An LED icon is displayed during heating.
 Reset	To quit from any state except the heating process by tube heater. After pressing this key, the splicer will return to the ready state with a beep sound.
 Cancel	To change the X/Y view image and display the data at the "Ready", "Pause", "Finish" state. To quit from input data at the MENU state.
 Enter	To open the menu at the "Ready" state. To select the command and decide the parameter at the menu state.
 Set	To start the splicing operation, or to go through to the PAUSE state. To move the cursor direction of arrow at menu state

Basic Operation

1. Inserting Power Supply into Splicer

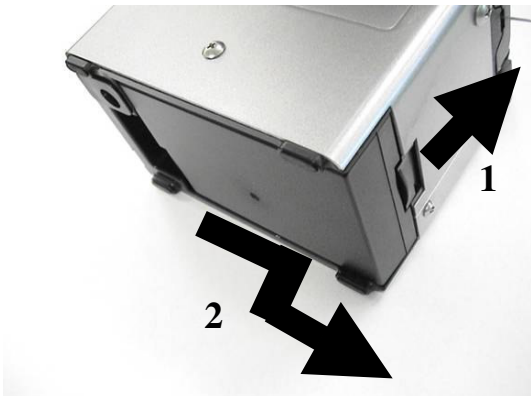
For AC operation, use the AC adapter (ADC-10) with the DC adapter (DCA-02) installed in the splicer. For battery operation, use the detachable battery (BTR-07). The Power Unit Dock, located on the splicer body, can accommodate both power supplies (DCA-02 and BTR-07).

1-1. Inserting or detaching power unit



Inserting power supply unit

Push the power unit into the dock and slide to engage the power unit lock.



Detaching power supply unit.

Push up on the power unit lock and slide the power unit out of the dock.

1-2. AC Operation

Insert the DC adapter (DCA-02) into the power unit dock and connect the AC adapter (ADC-10) to the DC adapter.

1-3. Battery operation

Insert the battery into the power unit dock. Check and make sure the remaining battery capacity is 20% or greater before operation. If the battery capacity is less than 20%, only a few splices can be made before the battery will be drained.

How to check remaining battery capacity

Turn the splicer ON. The battery is automatically identified as the power source and the remaining battery capacity is displayed on the "READY" screen.

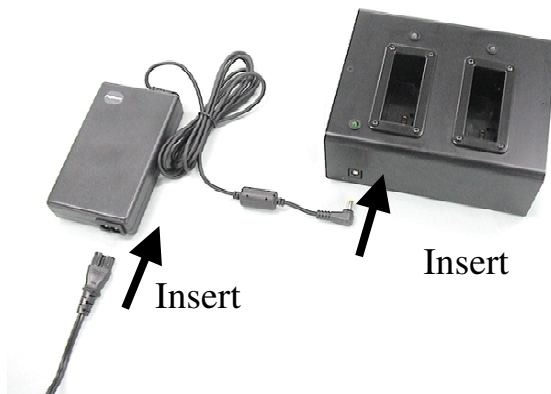
READY screen



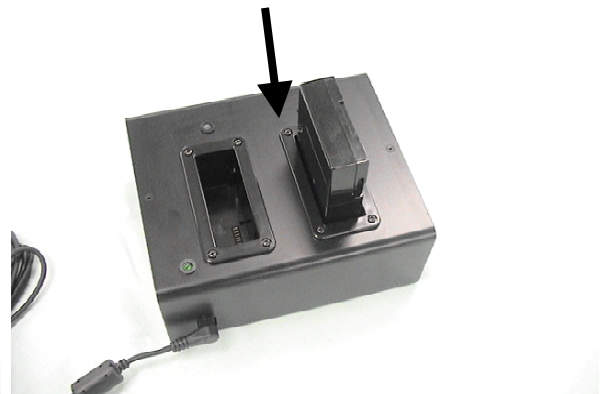
Remaining battery capacity indicator

Remaining battery capacity display	Remaining battery
(Blue Color)	80-100%
(Green Color)	60-80%
(Green Color)	40-60%
(Yellow Color)	20-40%
(Red Color)	Less than 20%

How to charge the battery



1. Connect the AC adapter (ADC-10) to the battery charger (BTC-04). The POWER LED turns ON (green)



2. Insert a battery pack in each slot. The charge LED turns ON (Red LED) and battery charging begins.



3. CHARGE LED turns off when the battery is fully charged.



- Please charge the battery before the first use.
- If CHARGE LED flashes, replace the battery with a new one.
- If battery charging does not complete within three hours or CHARGE LED does not turn ON, the battery, AC adapter, or both need replacement. Ask your service agent for further instruction.

Basic Operation

2. Turning splicer "ON"

Press . The READY screen is displayed after all the motors reset to their initial positions. The power source type is then identified. If operating on battery, the remaining battery capacity is displayed.



Monitor Angle

Adjust the monitor angle to comfortably see the screen.

Monitor brightness

Monitor visibility can be a problem depending on environmental conditions. To change the monitor brightness, press  or  to change the value and press  to confirm.



Splice Mode

Select the appropriate splicing mode for the specific fiber combination. The current mode is displayed on the READY screen.



- When selecting AUTO mode, arc calibration is automatically performed for consistent splicing performance.



Heat Mode

Select the appropriate heating mode for the specific protection sleeve used. The current mode is displayed on the READY screen.

The Help screen can be displayed by pushing  several times.

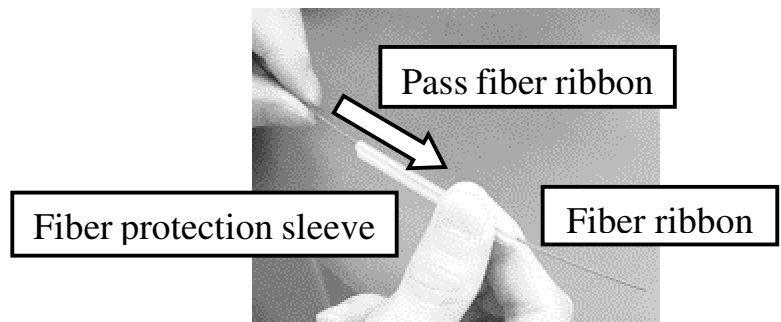


3. Cleaning optical fiber

Clean optical fiber ribbon coating with alcohol-impregnated gauze or lint-free tissue approximately 100mm from the tip. If the fibers are not cleaned properly, dust particulates from the fiber ribbon coating surface can enter the protection sleeve and might result in a future fiber break or attenuation increase.

4. Placing protection sleeve over fiber ribbon

Place the protection sleeve over the fiber ribbon. The sleeve will be shrunk down in the tube heater after the splice is complete.

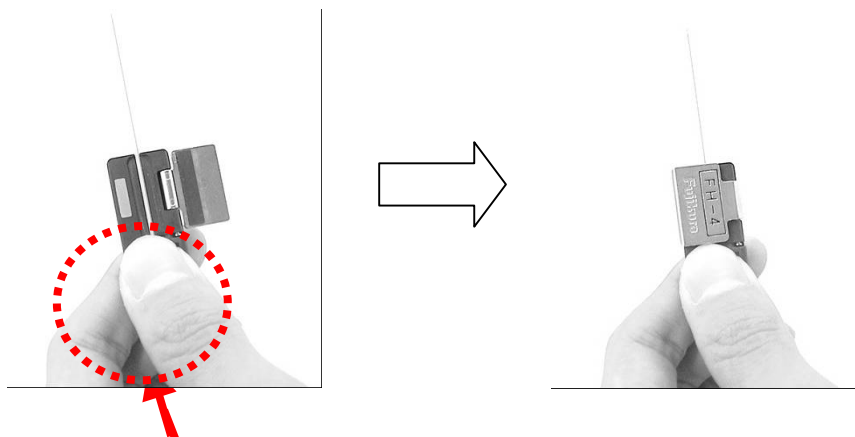


5. When using fiber ribbon

5-1. Setting fiber in fiber holder

If there is some bend in the section about 100 mm from the ribbon end, straighten that section by rubbing the ribbon with fingers.

There are two types of fiber holders; one for the left side and one for the right side. It is necessary to place each holder so that the hinge of the fiber holder is towards the heater. Open the lids of fiber holders and place the No.1 (typically blue) fiber near the hinge and set it so that 24 ~ 35 mm of fiber protrudes from the holder end. Close the lids of fiber holders.



Hold this point during fiber insertion.

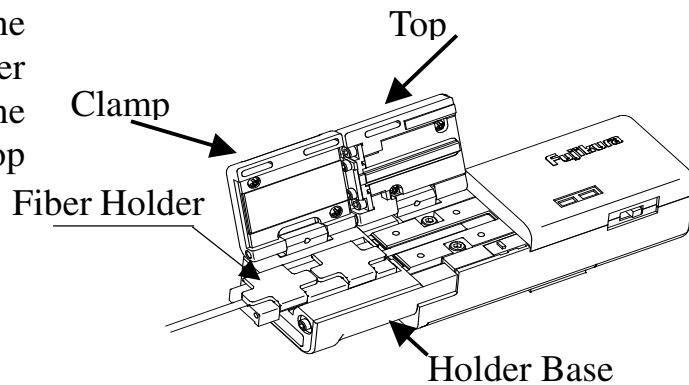


- Use fiber holders designed for the number of fibers in the ribbon.
- When setting fiber in fiber holder, hold the fiber in place while closing the lid of the fiber holder.

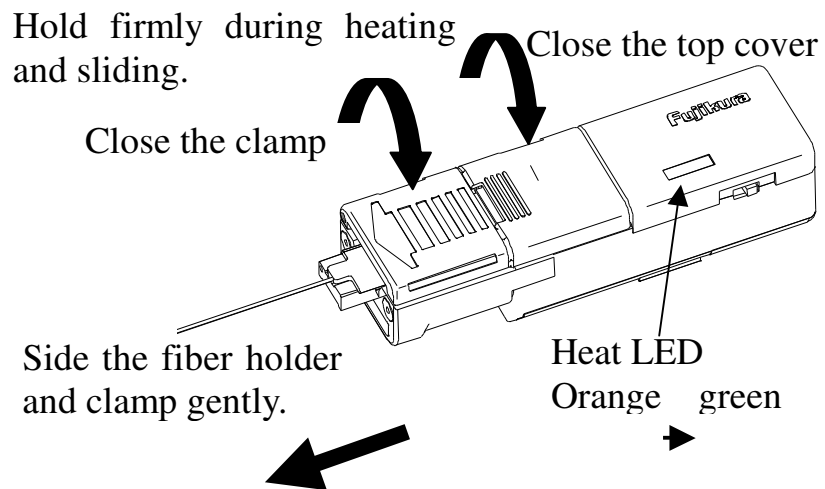
Basic Operation

5-2. Stripping and cleaning fiber

Open the clamp and top cover of the hot jacket stripper and set the fiber holder on the holder base of the stripper. Close the clamp and top cover.



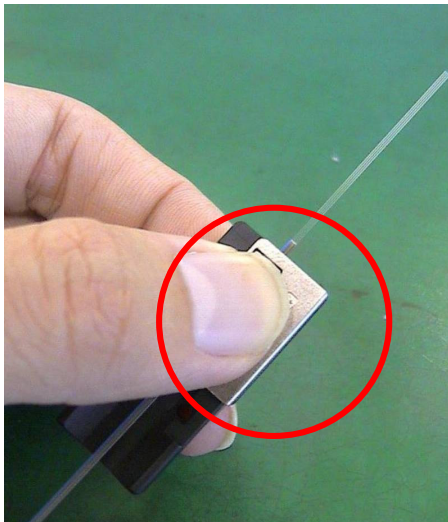
Firmly hold the holder base and body of the stripper and heat until the Ready light turns green, then gently slide the holder base to remove the coating.



Clean the fiber thoroughly with alcohol impregnated gauze or lint-free tissue. Use a fresh gauze or wipe for each ribbon. Do not use gauze or wipe twice.



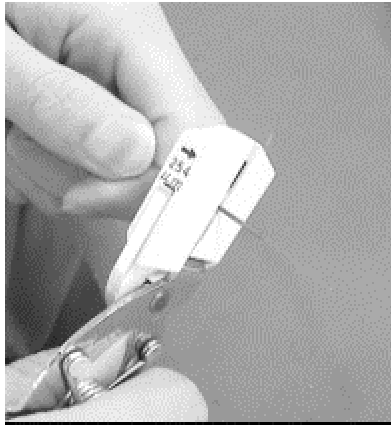
- Use a high quality alcohol, greater than 99% pure.
- There may be cases in which adjoining fibers are arranged over each other due to adhesion of alcohol to their surfaces. Gently flick the fiber ends to align the fibers.



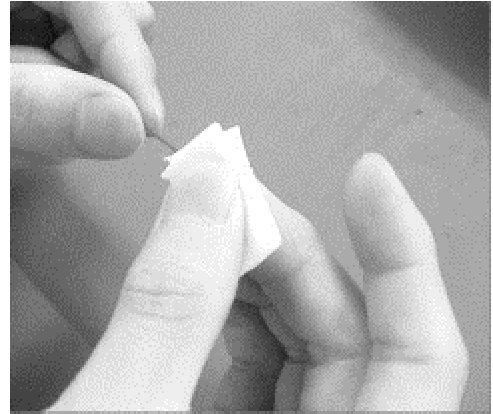
6. When using single fiber

6-1. Stripping and cleaning fiber

Strip the outer coating 24 to 35 mm from its tip with a stripping tool. Clean the bare fiber thoroughly with alcohol impregnated gauze or lint-free tissue. Use a fresh gauze or wipe for each fiber. Do not use gauze or wipe twice.



Stripping



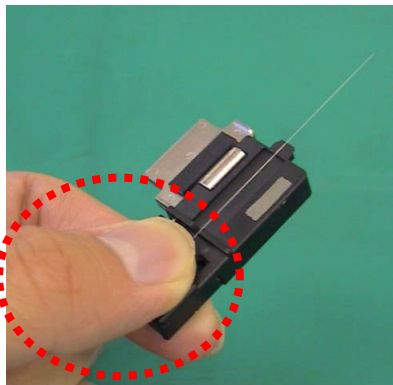
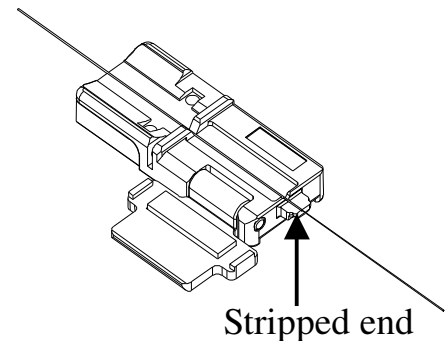
Cleaning



- Use a high quality alcohol, greater than 99% pure.

6-2. Setting fiber in the fiber holder

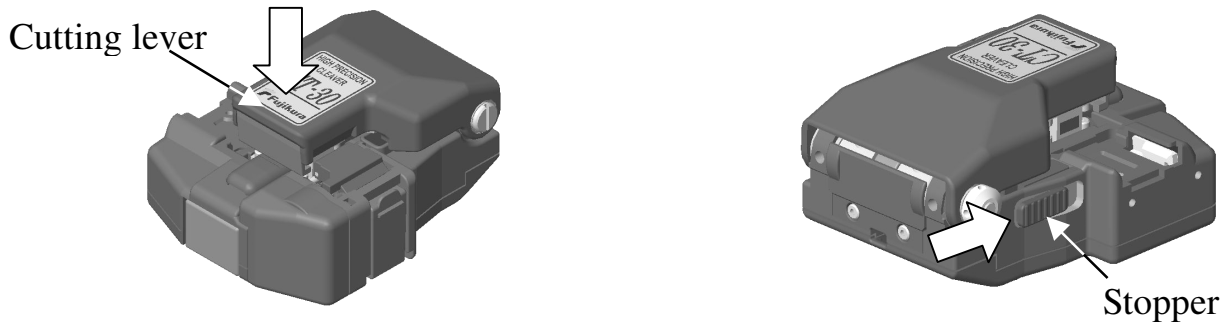
Set the fiber in the fiber holder, aligning its stripped end with the top of the protruding portion of the fiber holder.



Basic Operation

7. Fiber Cleaving

(1) To unlock the cutting lever, press it gently and slide the stopper.



(2) Push the slide button until it locks.

(3) Set the stripped optical fiber on the cleaver.

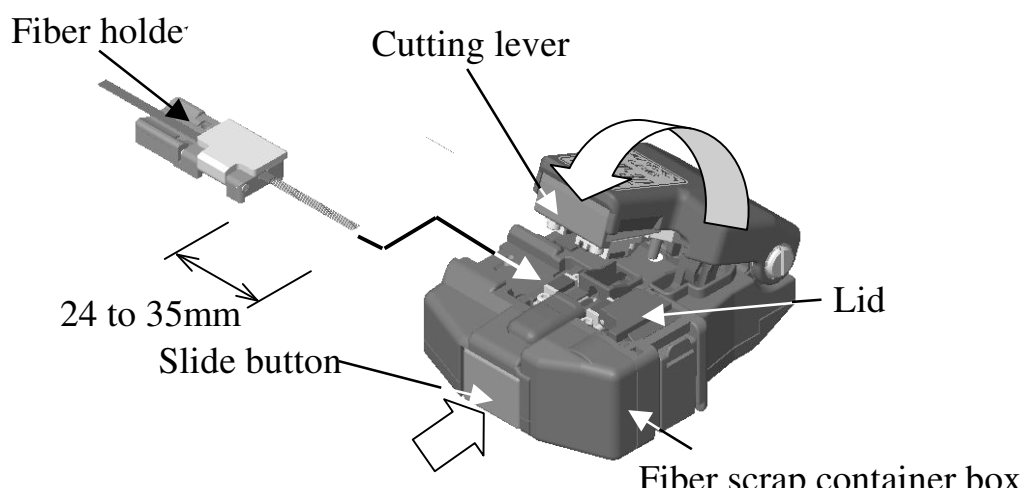
(4) Press down the cutting lever.

(5) Release the pressure on the cutting lever. A spring force will bring it to its open position.

(6) The scrap collector rollers drive the fiber scrap into the fiber scrap container box automatically when the cutting lever is raised.



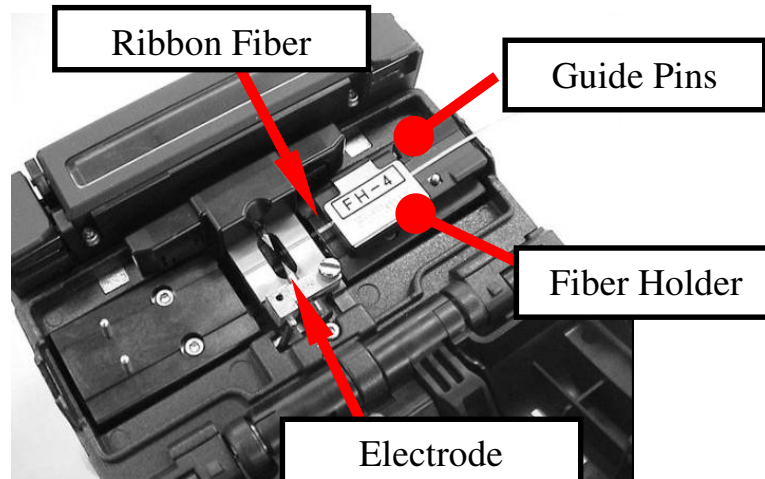
- Do not put fingers in the driving area of the slide button as personal injury may result.
- After pressing it half way down, releasing the pressure on the cutting lever may result in bad cleaving quality.
- Discard the fiber scrap container box contents frequently.



(8) When the cleaver is to be put up for the day, press the cutting lever down until the stopper can slide into place to lock the anvil lever.

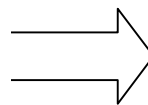
8. Loading fibers into the splicer

- (1) Open the wind protector.
- (2) Place left and right fiber holders on the guide pins.



- Be careful to not touch the prepared fiber tips to maintain fiber end-face quality.
- Note the proper positioning of the fiber holders on the sticker next to the fiber guide.
- Using [Monitor Rear] type, do not change the setting direction of the fiber holder in [Change of Operating Direction] (Page 49).

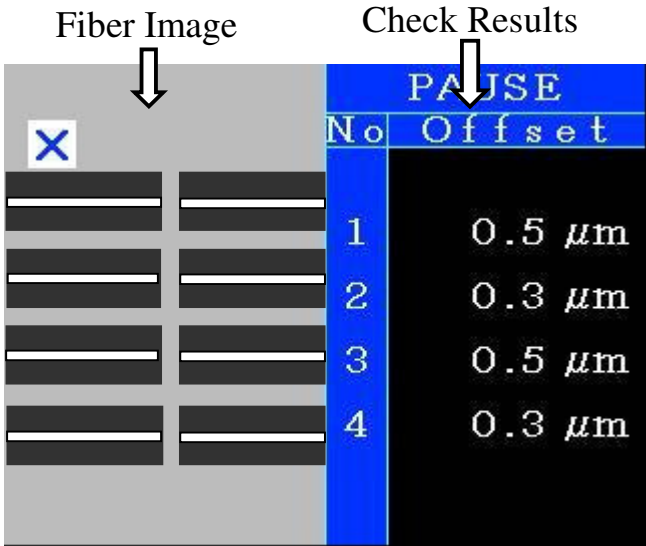
- (3) Close wind protector.



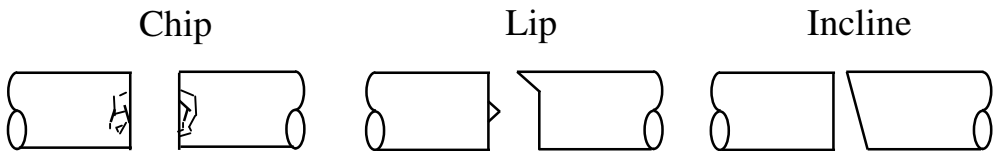
9. Splicing procedure

To ensure a good splice, the optical fiber is observed with the image processing system equipped in the *SpliceMate™*. However, there are some cases when the image processing system cannot detect a faulty splice. Visual inspection by the operator is often necessary for better splicing yield. The procedure below describes this process.

- (1) Fibers loaded in the splicer move forward. The forward motion of the fiber stops at a certain position shortly after the cleaning arc is performed. Next, the offset, gap, cleave angle, and end-face quality are checked. If the measured offset, gap, or cleave angle is greater than its set point or fiber chipping is detected, the buzzer will sound and an error message will warn the operator.



The splicing procedure pauses.
The end-face conditions below are used for visual inspection. If observed, remove the fiber from the splicer and repeat fiber preparation. These visual defects may cause a faulty splice.



- (2) After fiber inspection, the splicer pauses and the offset, gap distance, and cleave angle measurements can be displayed. Press to see each value.



- The cleave angle and offset threshold can be changed. See [Editing a splice mode] (Page 34) for details.
- The cleave angle error message can be ignored by pressing to go on to the next step. To disable the cleave angle error, see [Splice Option] (Page 44) for details.
- To hide the result data on display, see [Splice Option] (Page 44) for details.



FINISHED	
No	Loss
1	0.00 dB
2	0.00 dB
3	0.00 dB
4	0.01 dB

- (3) After measuring the cleave angle, etc., press the key and an arc discharge is performed to splice the fibers.
- (4) Estimated splice loss is displayed upon completion of splicing. Splice loss is affected by certain factors, such as MFD, stated in the next page. These factors are taken into account to estimate splice loss.

If either the measured cleave angle or the estimated splice loss exceeds its set point limit, an error message is displayed.

If the spliced fiber is detected as being abnormal, such as "Fat", "Thin", or "Bubble", an error message is displayed.

If no error message is displayed but the splice looks poor by visual inspection of the image on the monitor, it is strongly recommended to repeat the splice from the beginning.



- The splice point sometimes looks a bit fatter than other parts. This is considered a normal splice, and does not affect splice loss.
- To change the threshold for estimated splice loss or cleave angle, see [Splice Mode] (Page 30) for details.
- Error messages, such as "Estimated splice loss", "Splice angle", "Fat", "Thin", and "Bubble" can be ignored. This function can be set to "disabled". See [Splice Option] (Page 44) for details.

Splice loss may be improved in some cases by additional arc discharges.

Press for an additional arc discharge (re-arc). Splice loss estimate and splice check are performed again.



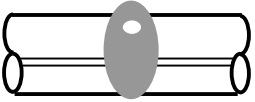
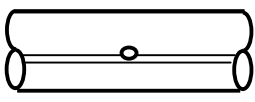
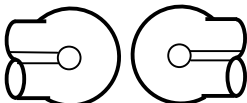
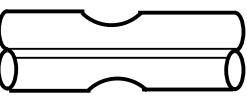
- Splice loss may be worsened in some cases by additional arc discharges (re-arcs). Additional arc discharge can be set to "disabled", or limited to the number of additional arcs. See [Splice Option] (Page 44) for details.

Basic Operation

Error Mark

When there is any error, below error mark appears in monitor.		
Gap Dif. 	Cleave  Left  Right	Thin 
Offset 	Shape  Left  Right	Fat 
Loss 		Bubble 

Splice loss increase : Cause and remedy

Symptom	Cause	Remedy
Combustion 	Bad fiber end-face quality	Check the cleaver
	Dust still present after cleaning fiber or cleaning arc.	Clean fiber thoroughly or increase [Cleaning Arc Time]
Bubbles 	Bad fiber end-face quality	Check cleaver condition.
	Prefuse power too low or prefuse time too short.	Increase [Prefuse Power] and/or [Prefuse Time].
Separation 	Fiber stuffing too small	Increase [Overlap]
	Prefuse power too high or prefuse time too long.	Decrease [Prefuse Power] and/or [Prefuse Time].
Fat 	Fiber stuffing too much	Decrease [Overlap].
Thin 	Arc power not adequate	Perform [Arc Calibration].
	Some arc parameters not adequate	Adjust [Prefuse Power], [Prefuse Time] or [Overlap].

(5) Storing splicing results

Splicing results can be stored in memory. Follow the storing procedure below.



- After the 1400th result is stored, the 1401st splice result is written over the 1st result.

Storing results automatically (No comment)

The splice result is automatically stored in memory when  is pressed upon completion of the splice at the [Finish] screen or when the wind protector is opened upon completion of the splice at the [Finish] screen.

Once a certain comment is recorded, the same comment is recorded into subsequent splice results. To change comments, see the next paragraph.

Storing results with comments

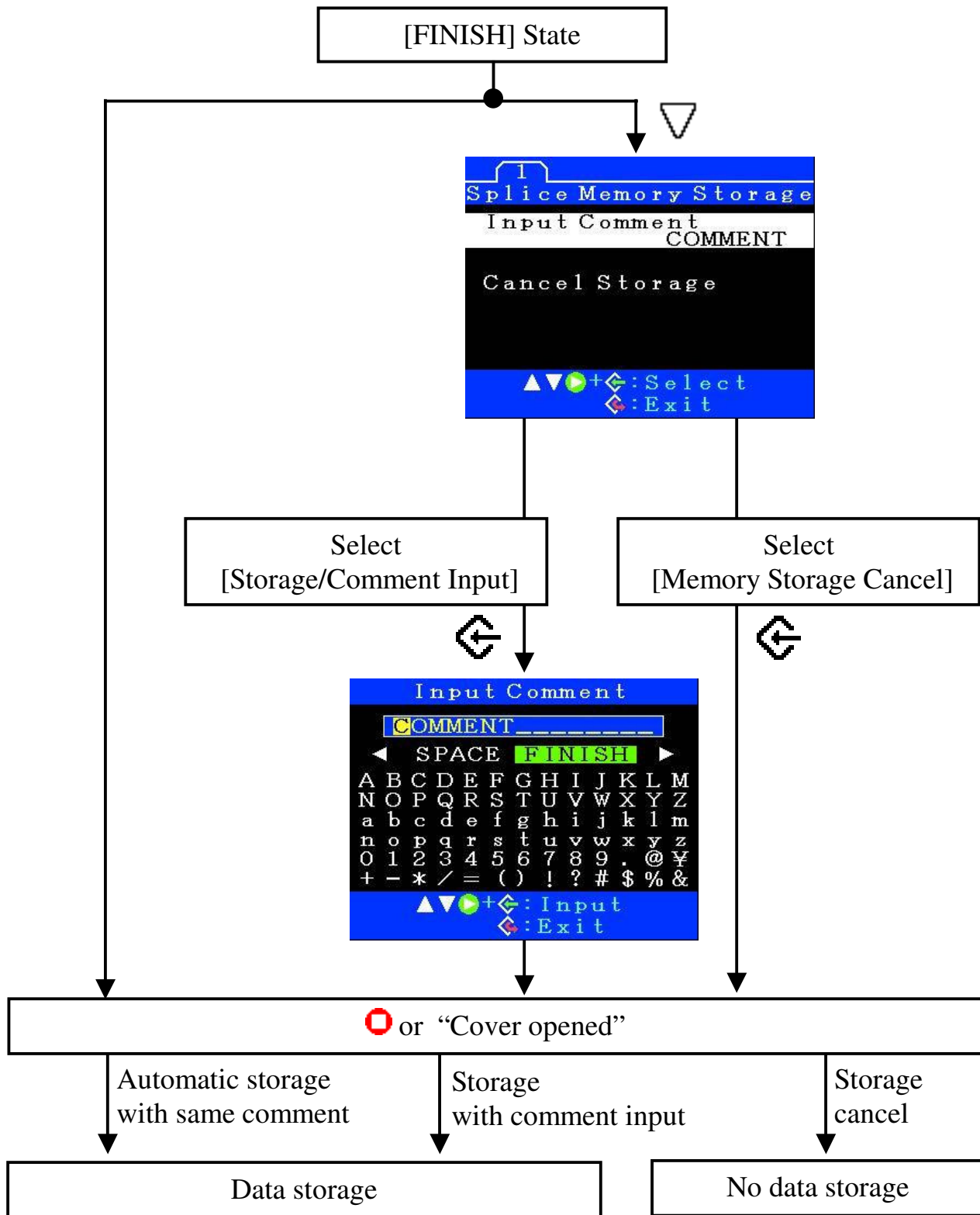
Press  at the [Finish] screen upon completion of the splice to display [Memory Storage Menu]. Move cursor to [Storage/Comment Input] and press  to display [Input Comment] screen, then input comment. Press  or open the wind protector at the [Finish] screen to store splicing results with comments.

Memory Storage Cancel

Press  at the [Finish] screen upon completion of the splice to display [Memory Storage Menu]. Move cursor to [Memory Storage Cancel] and press  to enter. No splicing results are stored even though  is pressed or wind protector is opened at the [Finish] screen upon completion of the splice.



- [Memory Storage Cancel] function can be set to "disabled". See [Splice Menu]



10. Removing spliced fiber

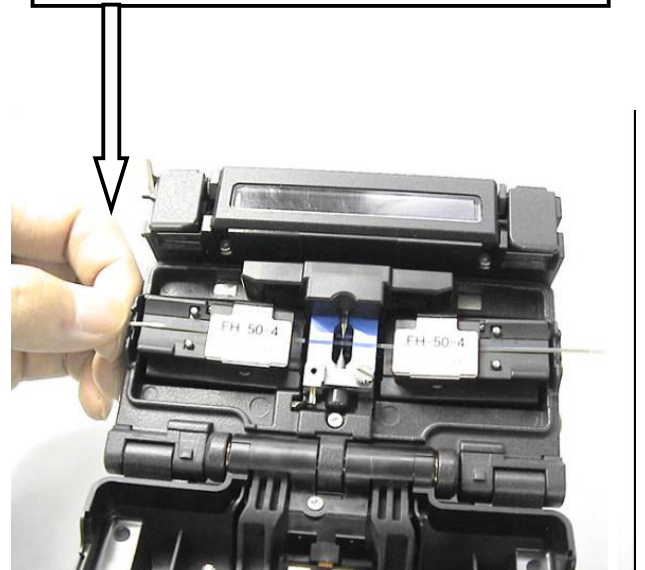
- (1) Open the lids of the tube heater.
- (2) Open wind protector. The splicer performs the proof test.
- (3) Hold the left fiber with left hand at the edge of wind protector and open the lid of left fiber holder.



- Keep holding fiber until fiber is completely transferred to the tube heater.

- (4) Open the lid of the right fiber holder.
- (5) Hold the right fiber with the right hand and remove spliced fiber from the splicer.

Hold left fiber with left hand at the edge of wind protector.



11. Heating protection sleeve

- (1) Transfer fiber with protection sleeve from the centering device to the tube heater.
- (2) Place fiber and protection sleeve in tube heater. While placing it in the tube heater, apply tension to the fiber so the tube heater lids automatically close.



- Make sure the splice point is located at the center of the protection sleeve.
- Make sure the strength member in the protection sleeve is on the bottom.
- Make sure the fiber is not twisted.

- (3) Press  to start the tube heater. The HEAT mark  is displayed during heating. The buzzer beeps and the  mark turns off when the heating cycle finishes.



- If  is pressed twice, the tube heating process is aborted.

- (4) Open the tube heater lids and remove the protected fiber from the tube heater. Apply tension to the fiber while removing it from the tube heater.



- Protection sleeve may stick to the bottom plate of the heater. Use a cotton swab to help remove sleeve from heater.

- (5) Visually inspect the finished sleeve to verify that no bubbles or debris/dust are present in the sleeve.

Maintenance of Splicing Quality

1. Cleaning and Checking before Splicing

Critical cleaning points and maintenance checks are described below.

1-1. Arc Power Calibration

Refer to [Arc Calibration] (Page 42).

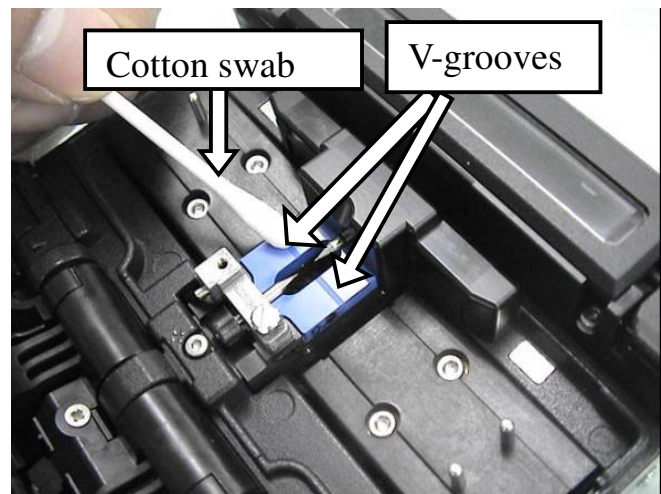
1-2. Cleaning V-grooves

If contaminants are present in the V-grooves, proper clamping may not occur, resulting in higher splice loss. The V-grooves should be frequently inspected and periodically cleaned during normal operation. To clean the V-grooves, do the following:

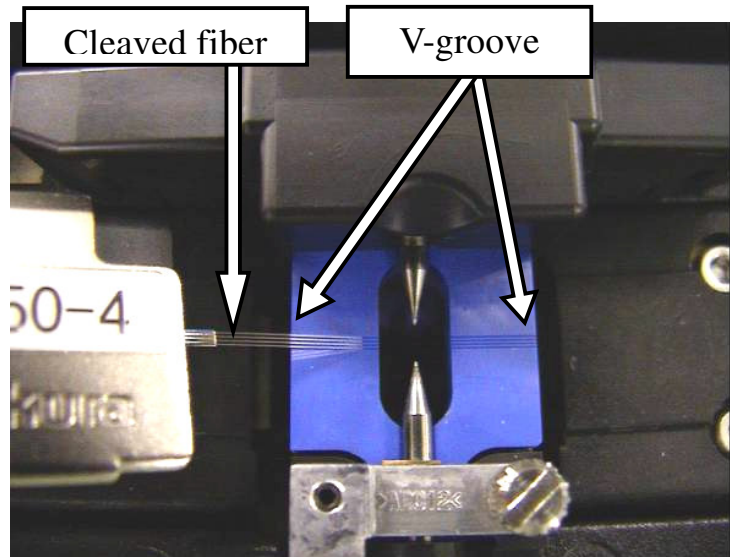
- (1) Open the wind protector.
- (2) Clean the bottom of the V-groove with an alcohol-impregnated thin cotton swab. Remove excess alcohol from the V-groove with a clean dry swab.



•Be careful to avoid contact with the electrode tips.



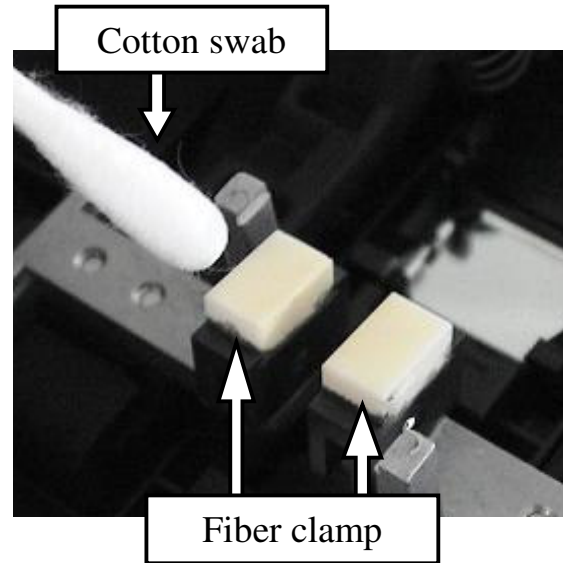
- (3) If the contaminants in the V-groove cannot be removed with an alcohol-impregnated thin cotton swab, use a cleaved fiber end-face to dislodge contaminants from the bottom of the V-groove. Repeat step (2) after this procedure.



1-3. Cleaning Fiber Clamp Chips

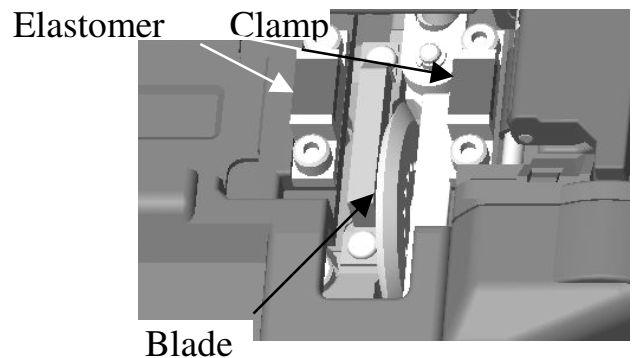
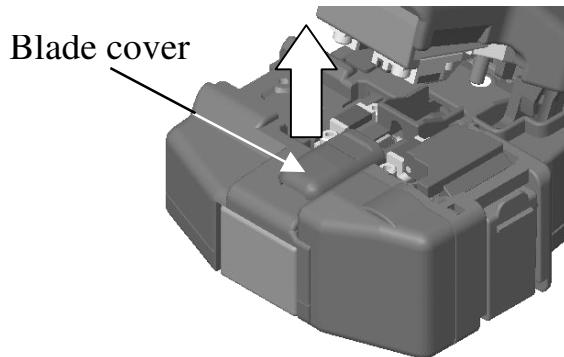
If contaminants are present on the clamp chips, proper clamping may not occur, resulting in poor quality splices. The fiber clamp chips should be frequently inspected and periodically cleaned during normal operation. To clean the clamp chips, do the following:

- (1) Open the wind protector.
- (2) Clean the surface of the clamp chip with an alcohol-impregnated thin cotton swab. Remove excess alcohol from the clamp chip with a clean dry swab.



1-4. Cleaning Fiber Cleaver

If the circular blade or elastomer clamp pads of the fiber cleaver become contaminated, the cleaving quality could degrade. This may lead to fiber surface or end-face contamination, resulting in higher splice loss. Clean the circular blade or elastomer clamp pads with cotton swab soaked with alcohol.



Maintenance of Splicing Quality

2. Periodic Checking and Cleaning

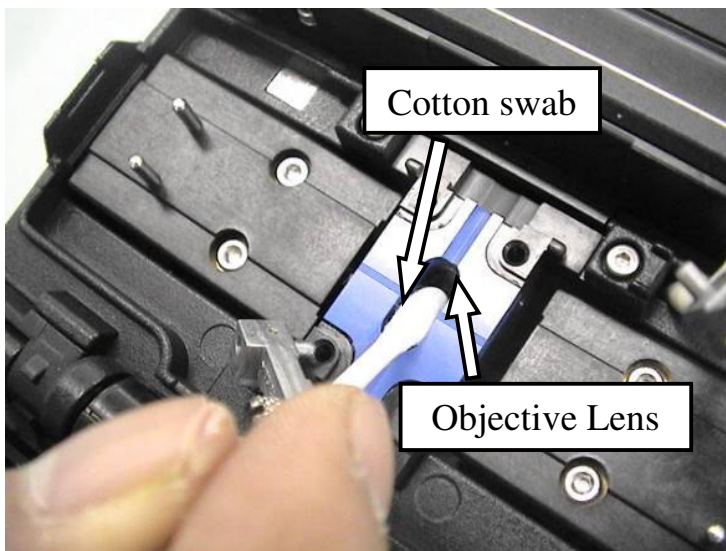
In order to maintain the splicing quality, periodical inspection and cleaning are recommended.

2-1. Cleaning Objective Lenses

If the surface of the objective lens becomes dirty, incorrect observation of the fiber position may occur, resulting in higher splice loss or poor splicer operation. Therefore, clean both objective lenses at regular intervals. Otherwise, dirt may accumulate and become impossible to remove. To clean the objective lenses, do the following:

- (1) Before cleaning the objective lenses, always turn off the splicer.
- (2) Gently clean the lenses (X-axis and Y-axis) with an alcohol-impregnated thin cotton swab. Using the cotton swab, start at the center of the lens and move the swab in a circular motion until you spiral out to the edge of the lens. Remove excess alcohol from the lens surface with a clean dry swab.

- Remove electrodes before cleaning objective lens.
- Do not hit or touch the tip of the electrode when cleaning.



- (3) The lens surface should be clean and free of streaks or smudges.
- (4) Turn on the power and make sure no smudges or streaks are visible on the monitor screen. Press  to change the screen and check the state of the lens surface on both the X- and Y-screens. Perform the dust check procedure.

2-2. Electrode Replacement

Refer to Page 56 [Replace Electrode].

2-3. Diagnostic Test

Refer to Page 59 [Diagnostic Test Function].

2-4. Rotating the Cleaver Blade

If the cleaver does not cleave properly, rotate the blade 1/16th of a turn to replace the worn out blade position with a sharp blade position. Blade life is normally 1000 cleaves or 250 ribbon cleaves per blade position. To rotate the blade, do the following:

- (1) Remove the blade cover.
- (2) Using a 1.5mm hex wrench, remove the fiber scrap container box or the side cover.
- (3) Push the slide button until it locks.



• When rotating the blade, do not touch the cutting edge. Move the blade with a thin cotton swab, for easy and safe rotation.

- (4) Using a 1.5mm hex wrench, loosen the blade lock screw.
- (5) Rotate the circular blade 1/16th of a turn.
- (6) Tighten the blade lock screw.
- (7) Attach the blade cover.

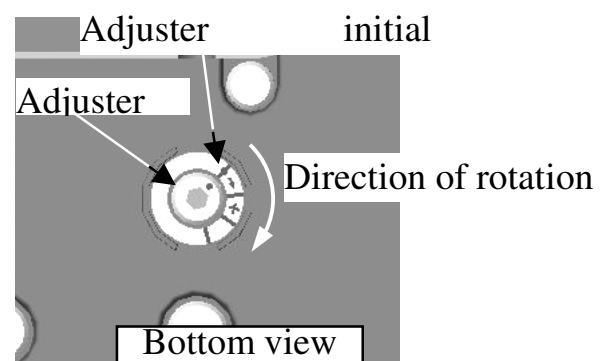
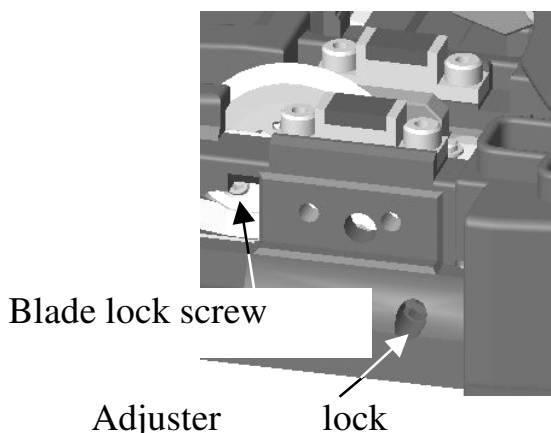
Blade Height Adjustment

After the circular blade has been rotated a complete revolution (16 positions), its height needs to be adjusted to compensate for the wear.

- (1) Using a 1.5mm hex wrench, remove the fiber scrap collector or the side cover.
- (2) Using a 1.5mm hex wrench, loosen the blade lock screw.
- (3) Using a 1.5mm hex wrench, loosen the adjuster lock screw.
- (4) Using a 1.5mm hex wrench, turn the adjuster clockwise so that the reference dot aligns with the next position mark. Never attempt to rotate the adjuster more than 2 position marks.
- (5) Tighten the adjuster lock screw.
- (6) Tighten the blade lock screw.



• After blade height adjustment, the 16 blade positions can be used again. If the cleaver does not cleave properly, rotate the blade.



Blade Replacement

After the circular blade has been raised 3 times and rotated through all positions (a total of approximately 48,000 fiber splices), it needs to be replaced. Contact your Fujikura splicer distributor.

1. Splice Mode

The optimum splice setting for a specific fiber combination consists of the following splicing parameters. In other words, the optimum splicing parameters depend on the fiber combinations and are different from fiber to fiber.

- Parameters for controlling arc discharge / heating.
- Parameters for calculating estimated splice loss.
- Parameters for controlling splicing procedures.
- Threshold for error messages.

A series of optimum splice parameters for major fiber combinations are already stored in the splicer. These parameters are stored in the database area and can be copied to the user-programmable area. These splice parameters can be edited for a specific fiber combination.

Database

Splice Mode	Description
AUTO	This splice mode counts the number of fibers and automatically selects the suitable splice mode; then the fibers are automatically spliced. This splice mode can splice standard telecommunications grade fibers, including SMF(ITU-T G.652), NZDSF(ITU-T G.655), and DSF(ITU-T G.653). The amount of heat applied to the fiber is calibrated in real time by analyzing the cladding illumination during arc discharge and adjusting the arc current accordingly. This splice mode does not require the operator to perform an arc calibration.  Points to note for AUTO mode • NZDS is specified using the splicing mode for standard NZDS fiber. However, for best results, it is recommended that the optimum splice mode be selected for a specific type of NZDS fiber. This is due to the variation in the NZDS fiber properties and optimum splicing parameters are different from one type of NZDS fiber to the next.
SM AUTO	This splice mode counts the number of fibers and automatically selects the suitable splice mode; then the fibers are automatically spliced. This splice mode can splice standard SM fiber(ITU-T G.652). The amount of heat applied to the fiber is calibrated in real time by analyzing the cladding illumination during arc discharge then adjusting the arc current accordingly. This splice mode does not require the operator to perform an arc calibration.

Splice Mode	Description
NZ AUTO	This splice mode counts the number of fibers and automatically selects the suitable splice mode; then the fibers are automatically spliced. This splice mode can splice standard NZDS fiber(ITU-T G.655). The amount of heat applied to the fiber is calibrated in real time by analyzing the cladding illumination during arc discharge then adjusting the arc current accordingly. This splice mode does not require the operator to perform an arc calibration.
DS AUTO	This splice mode counts the number of fibers and automatically selects the suitable splice mode; then the fibers are automatically spliced. This splice mode can splice standard DS fiber(ITU-T G.653). The amount of heat applied to the fiber is calibrated in real time by analyzing the cladding illumination during arc discharge then adjusting the arc current accordingly. This splice mode does not require the operator to perform an arc calibration.
MM AUTO	This splice mode counts the number of fibers and automatically selects the suitable splice mode; then the fibers are automatically spliced. This splice mode can splice standard MM fiber(ITU-T G.651). The amount of heat applied to the fiber is calibrated in real time by analyzing the cladding illumination during arc discharge then adjusting the arc current accordingly. This splice mode does not require the operator to perform an arc calibration.
SM	For splicing standard Single-mode fiber. Single fiber or 2 to 4 ribbon fiber is applicable. The MFD is 9 to 10 um at a wavelength of 1310 nm.
NZ	For splicing None-zero dispersion-shifted fiber. Single fiber or 2 to 4 ribbon fiber is applicable. The MFD is 8 to 10 um at a wavelength of 1550 nm.
DS	For splicing Dispersion-shifted fiber. Single fiber or 2 to 4 ribbon fiber is applicable. The MFD is 7 to 9 um at a wavelength near 1550 nm.
MM	For splicing Multi-mode fiber. Single fiber or 2 to 4 ribbon fiber is applicable. Core diameter : 50.0 - 62.5 um
BLANK	No parameters are loaded for this mode. Can also be used to erase the splice mode from a location

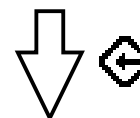
Splice Menu

1-1. Splice mode selection

Select an appropriate splice mode for the type of fiber to be spliced.

- (1) Press  at [READY], [PAUSE], or [FINISH] state to open [Splice Menu]. Select [Splice Mode Menu] and the [Select Splice Mode] menu is displayed.
- (2) Move the cursor by pressing ,  and press  to select [Splice mode].

READY



Splice Menu



Select splice mode menu



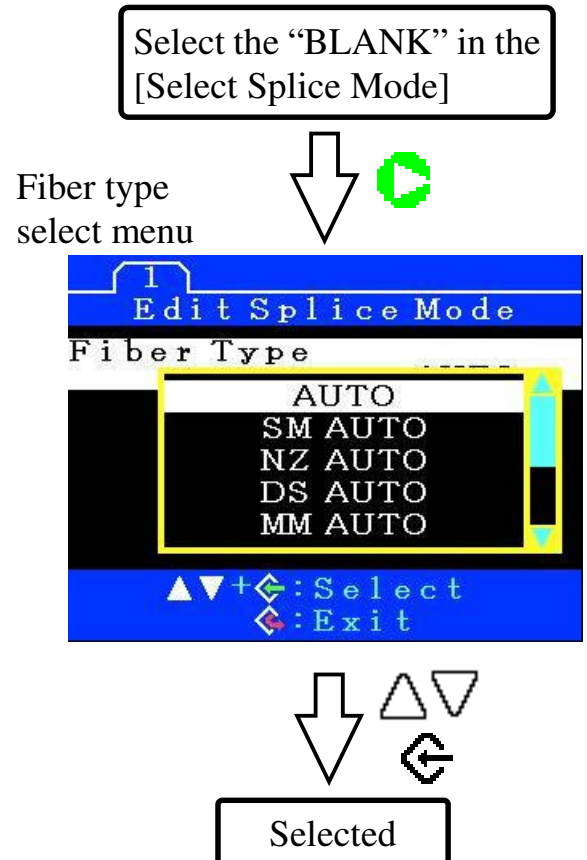
Selected

1-2. Creating or erasing a splice mode

How to create a splice mode

There are 5 splice modes stored when the splicer is first delivered, and all the other modes are displayed [BLANK]. Follow the steps below to add a splice mode.

Select a "BLANK" splice mode and press . Next press . The [Fiber Type] is displayed. Select one splice mode to be copied. Press twice to execute. Press to verify the fiber type is named in the specific splice mode.



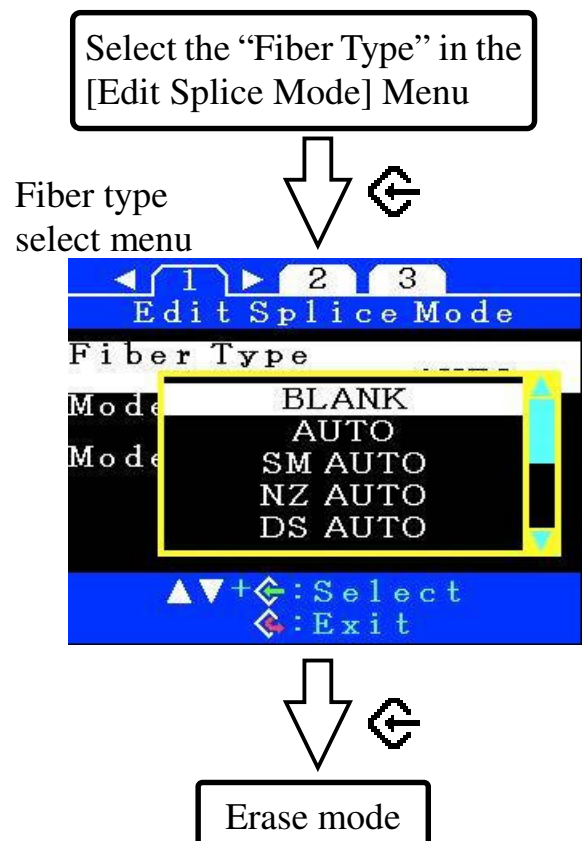
How to erase a splice mode

Splice modes can be erased. Follow the steps below to erase the splice mode.

- (1) Select the specific splice mode and press to go to [Edit Splice Mode] menu. Select [Fiber Type] by pressing .
- (2) Select "BLANK" and press twice to execute.



- Mode No.1 cannot be erased.
- Mode No.1 is automatically selected after erasing a splice mode.

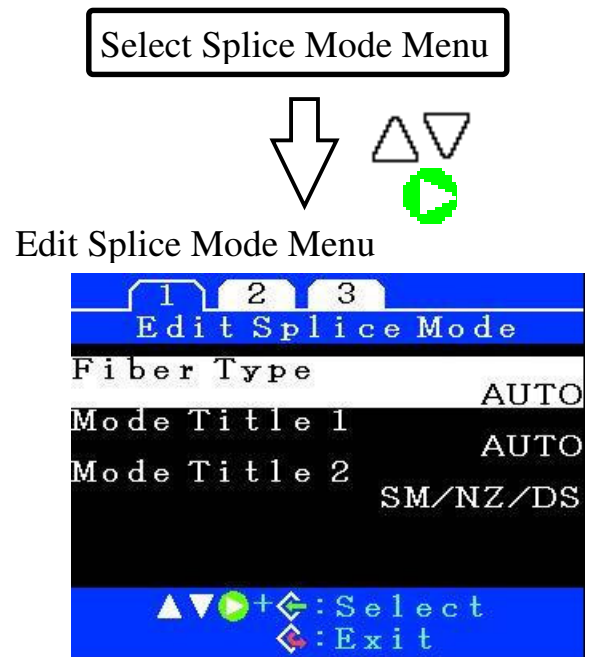


Splice Menu

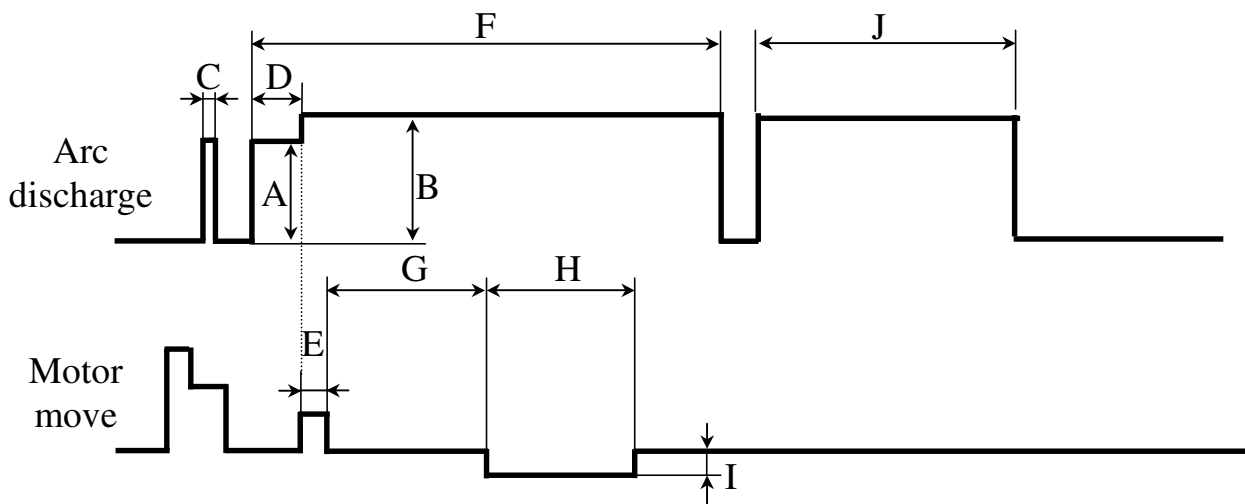
1-3. Editing a splice mode

Splicing parameters in each splice mode can be modified. Arc power and Arc time are considered the two most vital parameters. To edit parameters, do the following:

- (1) In [Select Splice Mode] menu, move the cursor to a splice mode to be modified. Press  to display [Edit Splice Mode] menu.
- (2) Move cursor by pressing   buttons to a parameter to be changed.
- (3) Press  to select parameter.
Press   to change its values.
Press  to accept changed values.



Below is a figure showing the Arc discharge conditions (relationship between "Arc power" and "Motor motion"). The conditions can be edited by changing the splicing parameters listed below. Depending on the splice mode, certain parameters cannot be changed.



A: Prefuse Power,
D: Prefuse Time,
G: Taper Wait Time,
I: Taper Speed,

B: Arc Power,
E: Overlap,
F: Arc Time
H: Taper Time related to Taper Length,
J: Rearc Time

AUTO mode

Below is a list of Splicing parameters for AUTO modes. The AUTO mode consists of [AUTO], [SM AUTO], [NZ AUTO], [DS AUTO], and [MM AUTO].

Only a limited number of parameters listed below are displayed for these modes to simplify the operation. Additional hidden parameters are automatically selected.

Parameter	Description
Fiber Type	List of splice modes stored in database is displayed. A selected splice mode stored in the database area is copied to a selected splice mode in the user-programmable area.
Mode Title1	Title for a splice mode expressed in up to 14 characters. Title1 is displayed at the left corner while splicing.
Mode Title2	Detailed explanation for a splice mode expressed in up to 14 characters. Title2 is displayed at the [Splice Mode Select] menu.
Offset Limit	An error message is displayed if the fiber offset exceeds the selected threshold (offset limit).
Cleave Limit	An error message is displayed if the cleave angle of either the left or right fiber ends exceeds the selected threshold (cleave limit).
Gap Dif. Limit	An error message is displayed if the gap between the left and right fiber ends exceeds the selected threshold (gap limit).
Loss Limit	An error message is displayed if the estimated splice loss exceeds selected threshold (loss limit).
Cleaning Arc	A cleaning arc burns out micro dust on the surface of the fiber with an arc discharge for a short period of time. The duration of the cleaning arc can be changed by this parameter.
Rearc Time	Splice loss may be improved by an additional “rearc” discharge in some cases. The duration of this additional arc can be changed by this parameter.
Arc Power	These parameters cannot be changed. The splicer changes this parameter automatically.
Arc Time	



- Menus change when [Fiber Type] is set [SM], [DS], [NZ], or [MM] mode.

Splice Menu

Standard mode

The standard mode consists of [SM], [NZ], [DS], and [MM] modes. These are in the user-selectable database. The user has the freedom to select from a series of pre-loaded splicing modes for various splicing combinations. Below are the descriptions of the various parameters used in these modes.

Parameter	Description
Fiber Type	A list of splice modes stored in the splicer database is displayed. Upon entering the appropriate mode, the selected splice mode stored in the database area is copied to a selected splice mode in the user-programmable area.
Fiber Count	Sets the number of fibers.
Mode Title1	Title for a splice mode expressed in up to 14 characters. Title1 is displayed at the left corner while splicing operation.
Mode Title2	Detailed explanation for a splice mode expressed in up to 14 characters. Title2 is displayed at the [Splice Mode Select] menu.
Offset Limit	An error message is displayed if the fiber offset exceeds the selected threshold (offset limit).
Cleave Limit	An error message is displayed if the cleave angle of either the left or right fiber ends exceeds the selected threshold (cleave limit).
Gap Dif. Limit	An error message is displayed if the gap between the left and right fiber ends exceeds the selected threshold (gap limit).
Loss Limit	An error message is displayed if the estimated splice loss exceeds selected threshold (loss limit).
Cleaning Arc	A cleaning arc burns out micro dust on the surface of the fiber with an arc discharge for a short period of time. The duration of the cleaning arc can be changed by this parameter.
Gap	Sets the end-face gap between the left and right fibers at the time of pre-fusion discharge.
Gapset Pos.	Sets the relative position of the splice location to the center of electrodes.
Prefuse Power	Sets the power of the prefuse arc, which is an arc discharge occurring from the beginning until the fibers begin stuffing. If [Prefuse Power] is set too low, axial offset may occur if the cleaved angles are relatively poor. If [Prefuse Power] is set too high, fiber end faces are heated excessively and splice loss increases .
Prefuse Time	Sets the duration of the prefuse arc, which is the arc discharge occurring from the beginning until the fibers begin stuffing. Longer [Prefuse Time] is synonymous with higher [Prefuse Power].

Parameter	Description
Overlap	Sets the overlap amount of the fibers at the fiber stuffing stage. Relatively small [Overlap] is recommended if the [Prefuse Power] is low, while relatively large [Overlap] is recommended if the [Prefuse Power] is high.
Arc Power	Sets Arc power. The arc intensity expressed in units of “bits”.
Arc Time	Sets Arc time. The total arc discharge time including the prefuse time.
Rearc Time	Sets Rearc Time. The additional arc discharge time after splicing.
Estimate	Selects splice loss estimation to "OFF" or "ON".
Minimum Loss	This amount is added to the estimated splice loss originally calculated. When splicing specialty or dissimilar fibers, a high actual splice loss may occur even with optimized arc conditions. To make the actual splice loss concur with the estimated splice loss, set the minimum value to the minimum optimized actual splice loss.
MFD	Sets MFD of the fibers. This MFD value is taken into account for estimating splice loss.
Est. Coef	This amount influences the splice loss estimation. When there is a difference between actual splice loss and estimated loss, adjust this value.
Proof Test	If [Proof Test] is set to "ON", a proof-test is performed upon opening the wind protector.
Taper Splice	Splice loss is sometimes improved when the fiber is tapered (pulled) during arc discharge to make the splice thinner. This sets taper function "ON". The following three parameters determine the taper shape.
Taper Wait	Sets the taper wait time from the end of fiber stuffing until the start of pulling the fiber.
Taper Speed	Sets the fiber pulling speed.
Taper Length	Sets the fiber pulling length.

Splice Menu

How to input a Mode title / Comments / Password

The character list below is displayed by selecting Mode Title / Comments / Password.

- (1) Move the cursor by pressing Δ , ∇ , or $\blacktriangle$ and press $\blacklozenge$ to input the selected character. If an incorrect character is entered, move the cursor to $\blacktriangleleft$ and press $\blacklozenge$ to highlight the character, then input the proper character over it.



- (2) Move cursor to [FINISH] and press $\blacklozenge$ on completion of entering characters.

In the case of Password input, the next screen image is displayed if the correct password is entered. If the input password is incorrect, the previous screen image is displayed.

2. Heater Mode

There are 10 user-programmable heating modes. Select the one best suited for the protection sleeve used.

Each tube-heating mode is optimized for a type of Fujikura protection sleeve. These modes can be found in the database area for reference. Copy the appropriate mode and paste it to the user-programmable area. The operator can edit the user-programmable modes.

Data Base

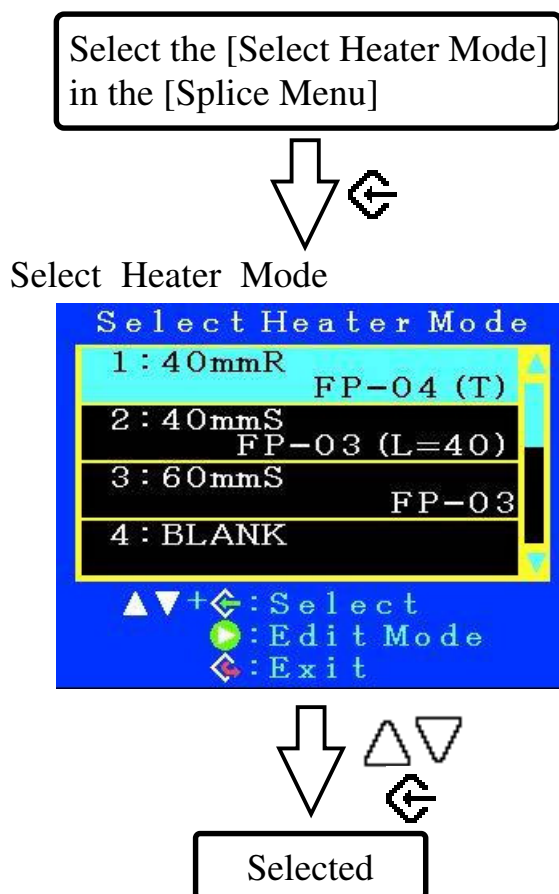
Parameter	Description
40mmR	For 40mm protection sleeves for ribbon fiber, up to 4, such as Fujikura FP-04(T) protection sleeve.
40mmS	For 40mm protection sleeves for single fiber, such as Fujikura FP-03 (L=40).
60mmS	For 60mm protection sleeves for single fiber, such as Fujikura FP-03.

Splice Menu

2-1. Selecting Heater mode

Select the heater mode most suitable for the protection sleeve to be used.

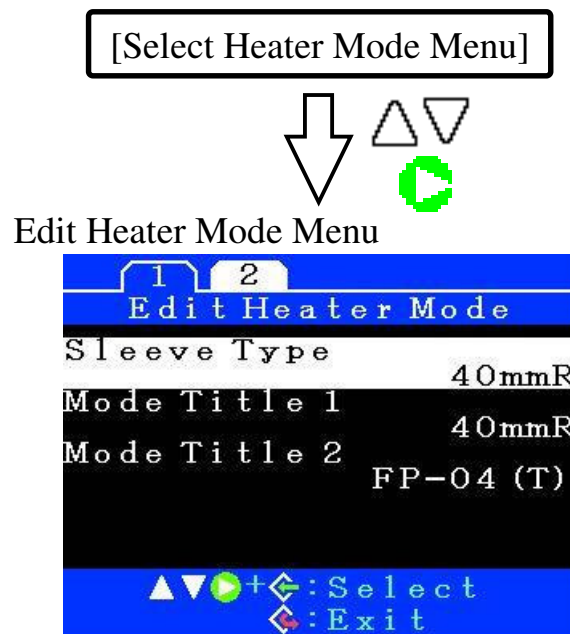
- (1) Select [Select Heater Mode] in [Splice Menu]. [Select Heater Mode] menu is displayed.
- (2) Move cursor by pressing Δ / ∇ and press $\hookrightarrow$ to select a heater mode.



2-2. Editing Heater Mode

Tube-heating conditions stored in heater mode can be edited or changed.

- (1) Move cursor and select a mode to be edited in [Select Heat Mode] menu. Press $\bullet$ to display [Edit Heat Mode] menu.
- (2) Press Δ / ∇ to move cursor to a parameter to be changed, then press $\hookrightarrow$ button to enter.
- (3) Change value by pressing Δ / ∇ , then press $\hookrightarrow$ to enter.



Heater mode parameters

Parameter	Description
Sleeve type	Sets sleeve type. List of all heater modes are displayed. Select a mode in the list and this is copied to a user-programmable mode.
Mode Title1	Title of a heater mode that is displayed in the lower right part of the monitor during the splicing/heating process. Max number of characters used is 5.
Mode Title2	Description of a heater mode in the [Sleeve Type] screen. Max number of characters used is 13.
Heater Control	Sets the heater control sequence. RIBBON40: For 40mm protection sleeve for ribbon fiber, up to 4. SINGLE60: For 60mm protection sleeve for single fiber SINGLE40: For 40mm protection sleeve for single fiber
Heat Time	Sets heating time from the beginning to the end (cool-down completion). Heating time is automatically adjusted with atmospheric conditions, such as ambient temperature. Heating time may be longer or shorter than the [Heat time] set.
Heat Temp	Sets heating temperature. If Nylon coated fiber is used with 8mm cleave length, the Nylon coating may melt if [Heat Temp] is over 190 degrees Celsius.
Finish Temp	Sets the finish temperature. When heater approaches this temperature, the buzzer beeps, announcing the sleeve is cooled down and is ready to be removed from the heater. Caution If the [Finish Temp] is set for over 100 degrees Celsius, the buzzer beeps before the sleeve is cooled and ready. Hot sleeves easily deform and can cause some residual stress at the splice point once the sleeve is finally cool.

3. Arc Calibration

Atmospheric conditions such as temperature, humidity, and pressure are constantly changing, which creates variability in the arc temperature. This splicer is equipped with temperature and pressure sensors that are used in a constant feedback control system to regulate the arc power at a constant level.

Changes in arc power due to electrode wear and glass adhesion cannot be corrected automatically. Also, the center position of arc discharge sometimes shifts to the left or right. In this case, the fiber splicing position has to be shifted in relation to the arc discharge center. It is necessary to perform an arc power calibration to eliminate both of these issues.



- Arc calibration is performed automatically when using AUTO mode only. Therefore arc calibration does not have to be performed when splicing in this mode.
- When changing splice modes, except AUTO mode, perform this function.

Arc Calibration procedure

- (1) Select [Arc Calibration] in [Splice Menu] to display Arc Calibration screen.
- (2) Set prepared fibers in the splicer.
- (3) The following is performed after pressing .
 1. Cleaning arc discharge
The left and right fibers move forward. The splicer performs the cleaning arc discharge.
 2. Gap setting
The left and right fibers move closer and stop at the specified gap setting position.
 3. Arc discharge
The splicer performs an arc discharge without stuffing the fibers together. . The gap between the left and right fibers is increased by the arc discharge.
 4. Measurement result
After the arc discharge, the melt-back amounts of the left and right fibers are measured by image processing circuits in the splicer.

(4) The calibration result is displayed after completion.

“Test Finished” message

Arc power and splicing position calibration were successfully completed. Press  to exit.

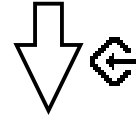
“Test Again” message

The arc power and splicing position calibration were completed but further calibration is strongly recommended, as the change from the previous arc calibration is too large. Press  to perform arc calibration, or  to exit even though arc calibration is not complete.

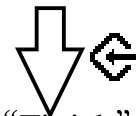
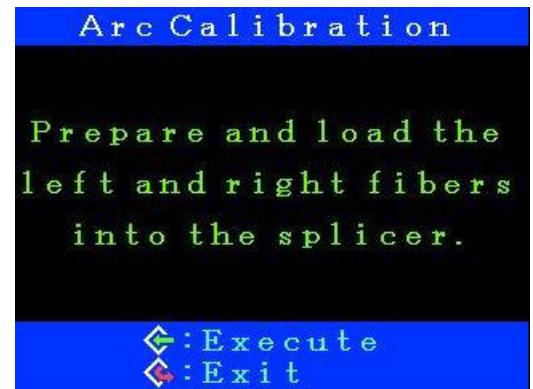


- In some cases, multiple iterations of arc calibration are needed until the calibration process is successfully completed and the "Test Finished" message is displayed. Arc calibration can be considered almost complete if multiple iterations are completed without receiving the message.
- A specific numeric threshold can be set so that "Test Finished" message is displayed after a specific number of arc calibrations are performed. See [Other Option] (Page 55) for

Select [Arc Calibration]
in the [Splice Menu]



Arc calibration



Arc calibration “Finish”



Arc calibration “Test Again”

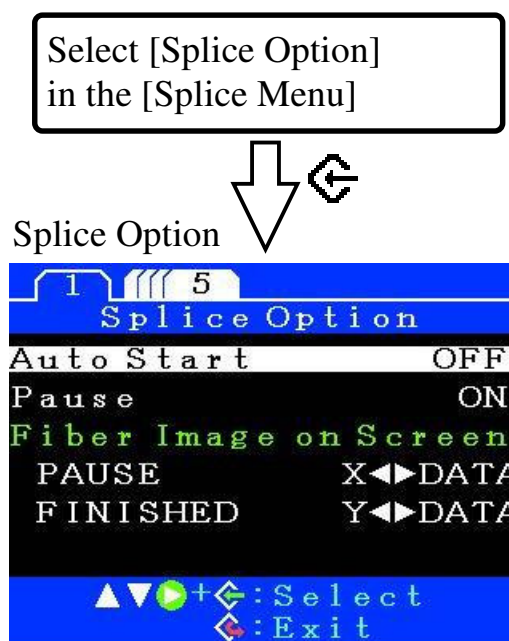


Splice Menu

4. Splice Option

Common parameters for all splicing and tube heating modes can be set.

- (1) Select [Splice Option] in [Splice Menu] to display [Splice Option] menu.
- (2) Select a parameter to be changed.
- (3) Press $\Delta \nabla$ to change values, and press $\leftarrow$ to enter.



Setting parameters

Parameter	Description
Auto Start	If “Auto Start” is set to "ON", splicing starts automatically as soon as the wind protector is closed. Fibers should be prepared and placed into the splicer in advance.
Pause	If "Pause" is set to “ON”, splicing operation pauses when fibers are forwarded to the gap-set position. Cleave angles, gap, and offset are displayed during the pause. Press $\leftarrow$ key twice to display results table.
Fiber Image on Screen	
PAUSE	Setting the fiber image on the screen in Pause / Finish statement. X<=>DATA : Composite display X-axis and result of cleave angle, offset, and gap.
FINISHED	Y<=>DATA : Composite display X-axis and result of cleave angle, offset, and gap. DATA : Display result of cleave angle, offset, and gap.

Parameter	Description
Ignore Splice Error	
Offset	Setting to “Disable” prevents the splicer from continuing a splice even if the message “Offset Error”, “Gap Error”, “Cleave Angle Error” is disregarded.
Gap	
Cleave	
Loss	
Bubble	Setting to “Disable” prevents the splicer from normally finishing its operation even if the message “Loss Error,” “Bubble Error,” “Fat Error” or “Thin Error” is disregarded.
Fat	
Thin	
Arc Compensation	
Arc Compensation Temperature	Setting to “OFF” turns off arc power compensation due to pressure and temperature changes.
Fiber Image on Screen	
Auto Fiber Forward	If “Auto Fiber Forward” is set to “ON”, fibers are automatically moved closer to gapset as soon as wind protector is closed.
Cleave Shape Error	Error message is displayed if the cleaved end face of either left or right fiber exceeds the selected threshold (cleave shape).
Max. Number of Rearcs	The re-arc process sometimes improves the splice loss, but sometimes worsens it. Re-arc decreases the splice strength. With this function, it is possible to limit the number of re-arcs or to disable re-arc discharge.

5. Splice Result

This splicer stores up to 1400 splicing results. See [Splicing procedure] (Page 20) for detail. Contents of data stored are different depending on splicing mode.

AUTO mode

▼ Memory No.345 1/4▲
 COMMENT
 2004/11/16 10:25
 AUTO
 No Error
 ◀:Input Comment
 ▶:Exit

▼ Memory No.345 2/4▲

No	Loss	Warning
1	0.00 dB	
2	0.00 dB	
3	0.00 dB	
4	0.00 dB	

▼ Memory No.345 3/4▲

No	Gap	Offset	Angle
1	51 μm	0.4 μm	1.3°0.6°
2	44 μm	0.3 μm	1.1°1.1°
3	41 μm	0.6 μm	0.2°0.9°
4	42 μm	0.6 μm	1.6°0.6°

▼ Memory No.345 4/4▲
 Offset Limit 5.0 μm
 Cleave Limit 5.0°
 Gap Dif. Limit 50 μm
 Loss Limit 0.20 dB
 ◀:Input Comment
 ▶:Exit

Standard mode

▼ Memory No.341 1/5▲
 COMMENT
 2004/11/15 20:49
 SM4
 No Error
 ◀:Input Comment
 ▶:Exit

▼ Memory No.341 2/5▲

No	Loss	Warning
1	0.02 dB	
2	0.00 dB	
3	0.02 dB	
4	0.01 dB	

▼ Memory No.341 3/5▲

No	Gap	Offset	Angle
1	50 μm	0.4 μm	0.2°1.3°
2	46 μm	0.3 μm	0.5°0.8°
3	45 μm	0.9 μm	0.7°1.1°
4	42 μm	0.6 μm	0.5°1.7°

▼ Memory No.341 4/5▲
 Offset Limit 5.0 μm
 Cleave Limit 5.0°
 Gap Dif. Limit 50 μm
 Loss Limit 0.20 dB
 ◀:Input Comment
 ▶:Exit

▼ Memory No.341 5/5▲
 Gap 40 μm
 Gapset Pos. CENTER
 Prefuse Power STD
 Prefuse Time 500 ms
 Overlap 25 μm
 Arc Power STD
 Arc Time 10000 ms
 ◀:Input Comment
 ▶:Exit

5-1. Displaying splicing results

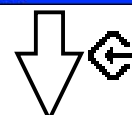
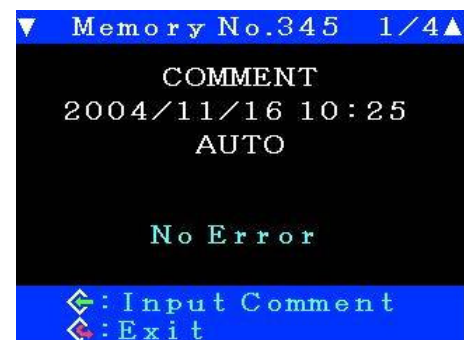
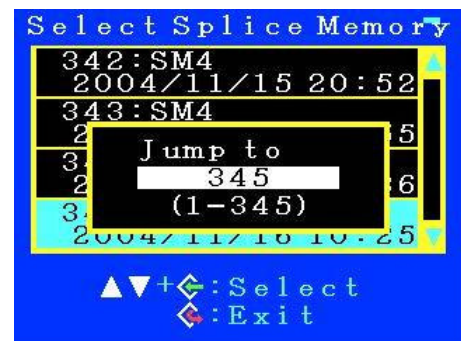
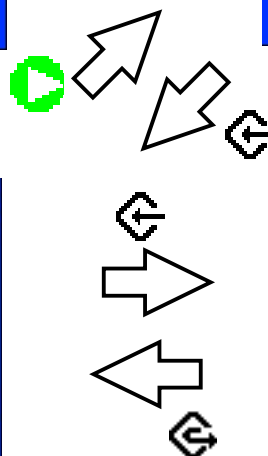
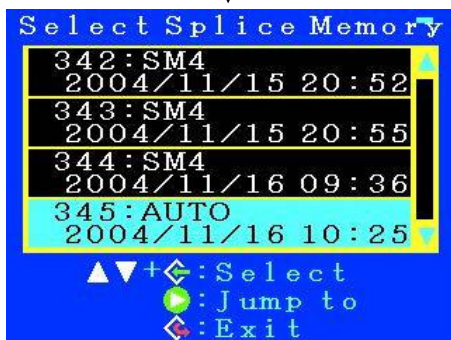
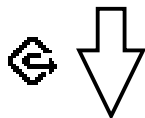
Splicing results stored in the memory can be displayed. Comments can be added or edited.



- Data stored in the splicer memory can be download by USB to a PC. Consult your nearest sales agency to learn how.

- (1) Select [Splice Memory] in [Splice Menu].
- (2) Select [Display Splice Memory] and press to display [Select Splice Memory] Menu.
- (3) Select memory number by either one of the methods stated below. One method is to move cursor to a specific memory number and press . The other method is to press to display the [Jump to] screen. Input a specific memory number and press . Press to display the data.
- (4) The selected splicing result is displayed. For adding or editing comments, press to display [Input Comment] screen.

Select the [Splice Memory]
in the [Splice Menu]



Input Comment

5-2. Clearing splicing results in memory.

- (1) Select [Clear Splice Memory] at [Splice Memory] menu to display [Memory clear] menu.

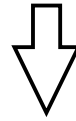
Clearing all splicing results in memory

- (2) Move cursor to [Clear All Memory] and press  to display [All Memory Clear].
- (3) Press  to clear all splicing results in memory.

Clear selected splicing results in memory

- (2) Move cursor to [Clear Partial Memory] and press  to display [Partial Memory Clear].
- (3) Input specific number (begin-number and end-number) of the splice result(s) to be cleared by pressing    and  to enter. The selected splicing result(s) are cleared. Cleared results are replaced with the remaining splicing results.

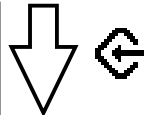
Select the [Clear Splice Memory] in the [Splice Memory]



Clear selected splicing results in memory

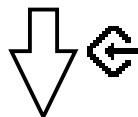
Clear all splicing results in memory

Select the [Clear Partial Memory]



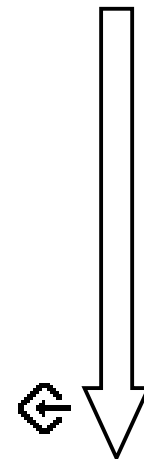
Input specific number (begin-number and end-number) of the splice result(s) to be cleared by pressing $\Delta \nabla$ and $\diamond$ to enter.

- If [Begin-number] is bigger than [End-number], selected splicing results cannot be cleared. Input appropriate number again.



$\diamond$ to enter. The selected splicing result(s) are cleared. Cleared results are replaced with the remaining splicing results.

Select the [Clear All Memory]

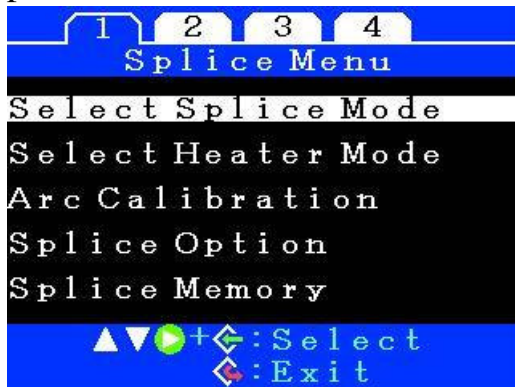


Press $\diamond$ to clear all splicing results in memory.

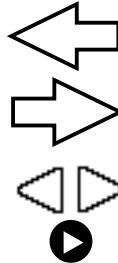
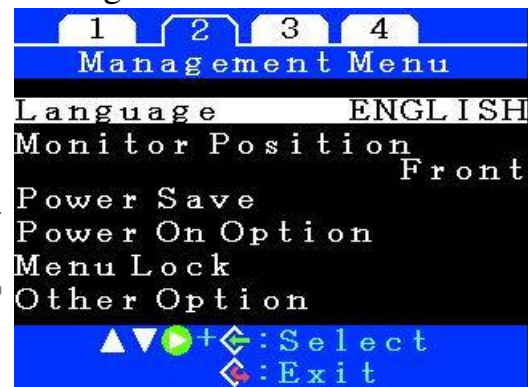
Management Menu

This menu is used to change settings in detail or for an administrator to limit functions available for an operator to select or change.

Splice Menu



Management Menu



Parameter	Description
Language	Sets a language to be displayed on the screen. Select a language to be displayed.
Monitor Position	Sets the operational direction of splicer. [Front] is for front monitor operation. [Rear] is for rear monitor operation. Refer to following Change of Operating Direction for details.
Power Save	Sets the power saving mode.
Power On Option	Sets the start-up screen image and function. This menu is secured by password.
Menu Lock	Used for an administrator to limit functions available for the operator to select or change. This menu is secured by password.
Other Option	Sets other parameters not included in [Power On Option] and [Menu Lock]. This menu is secured by password.

1. Change of Operating Direction

The splicer is shipped from the factory with default settings for "Monitor Front" operation. This can be changed to "Monitor Rear" operation. When [Monitor Position] is changed, the direction of the arrow keys is reversed.

Changing monitor position

- (1) Select a monitor position in [Monitor Position] menu and turn off splicer and change the monitor angle.



Monitor Front



Monitor Rear

- (2) Turn splicer Power on.

2. Power Save

This function is important for battery conservation. If the power saving function is not set during battery pack use, the number of splice cycles will be reduced. The splicer automatically identifies the type of power supply unit and can be programmed to utilize difference power save settings for different power supplies.

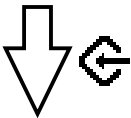
Setting Power Save

- (1) Insert a power unit and turn splicer power on.
- (2) Select [Power Save] in the [Management Menu]. [Power Save] is displayed for the type of power supply used.
- (3) Change value of [Monitor Shut Down] and [Splicer Shut Down].

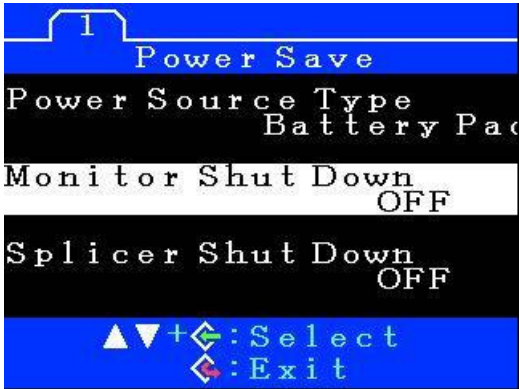


- The value can be changed only for the power unit being used.

Select the [Power Save] in the [Management Menu]



Power Save Menu



Parameter	Descriptions
Power Source Type	The type of power supply.
Monitor Shut Down	Setting this function turns off the power supply to the LCD monitor if the splicer does not perform an action within a certain period of time. Always set this function to a specific shutdown time when using the battery pack. When the power supply to the LCD monitor turns off, F mark is displayed at intervals of 5 seconds on the monitor. Pressing any key turns on the LCD monitor. 
Splicer Shut Down	Automatically turns off the power supply to the splicer if it performs does not perform an action within a certain period of time. The function serves to prevent the battery capacity from running low if the splicer is left on for an extended period of time.

3. Menu Lock / Power On Option / Other Option

- (1) Select [Power On Option], [Menu Lock], or [Other Option] in the [Management Menu]. The password input screen is displayed.
- (2) Input Password.
Refer to [Password] (Page 38) on how to input password.
- (3) Change a parameter value.

3-1. Menu Lock

Used for Administrator to limit operator from selecting or changing certain functions.

Parameter	Descriptions
Splice Mode	
Edit	Setting to “Disable” prevents unauthorized editing and selecting of splice modes.
Select	
Heater Mode	
Edit	Setting to “Disable” prevents unauthorized editing and selecting of heater modes.
Select	
Splice Option	
Page2 to 5	Pages 2 to 5 in [Splice Option] Menu cannot be edited if this is set to “Disable”.
Splice Memory	
Clear	Setting to “Disable” prevents unauthorized erasing of splice result data on the memory.
Cancel Data Storage	Setting to “Disable” prevents unauthorized canceling of storage of splice result data on the [FINISH] screen.
Power Save Edit	
Monitor	Setting to “Disable” prevents unauthorized changing of the power saving function.
Splicer	
Maintenance	
Arc Calibration	Setting to “Disable” prevents unauthorized changes to various functions related to maintenance.
Replace Electrodes	
Stabilize Electrodes	
Clear Arc Count	
Battery Discharge	
Set Calendar	
Diagnostic Test	
Dust Check	
Motor Drive	

3-2. Power On Option

Set Opening title and Password Lock function

Parameter	Descriptions
Opening Title1	Sets the message to be displayed when the power is turned on. Max. number of characters : 15 (Opening Title1) 15 (Opening Title2) To edit Title, refer to Page 38 [Title] on how to input title.
Opening Title2	
Dust Check	Setting to “ON” executes the [Dust Check] function when the power is turned on.
Password Lock from	Beginning at the selected date, a password is required at boot up in order to operate the splicer. Password is the same as the Password for [Other Option] (Page 55).

3-3. Other Option

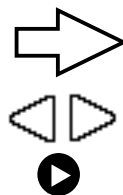
Sets other parameters other than what are in [Power On Setting] and [Menu Lock Setting] menus.

Parameter	Descriptions
System Settings	
Password	Changes the password to access the [Power On Option], [Menu Lock], [Other Option], [Password Lock from] menus. Maximum Characters : 8 At the time of shipment from factory, the password is set at “0”[zero]. If you have forgotten your password, contact the nearest sales agency.
Buzzer Volume	Sets the sound volume of the buzzer.
Electrode	
Electrode Caution	After 1,000 splices have been made, the caution message prompting for electrode replacement is displayed when the power is turned on. When the number of splices exceeds 2,000, the caution message changes to the warning message. The number of arc discharges at which to start these messages is set in this field.
Electrode Warning	
Maintenance	
Last Maintenance	The date of last maintenance and the scheduled date for next maintenance are entered in the respective fields. This information is displayed on the [Maintenance Info.] screen. Refer to the next section.
Next Maintenance	
Arc Calibration	
Cleave Limit	Sets the threshold of cleave angle error in the [Arc Calibration].
Max. Num. of Tests	Sets the number of tests to finish the [Arc Calibration] with “Test Finished” message.

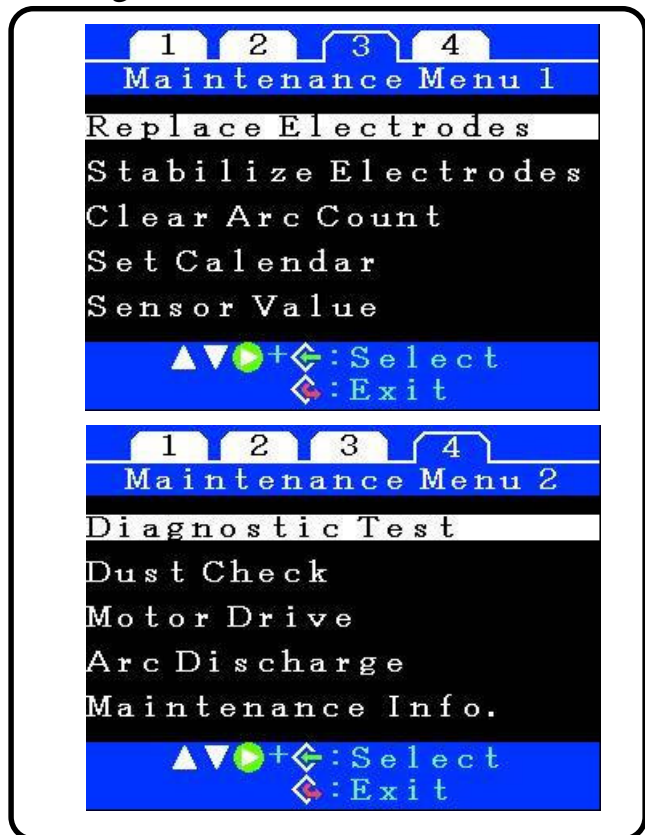
Maintenance Menu

The splicer has the ability to perform routine maintenance. This section describes how to use the maintenance menu.

Splice Menu



Management Menu

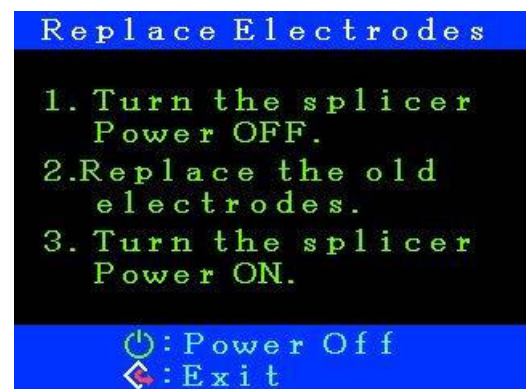


1. Replace Electrodes

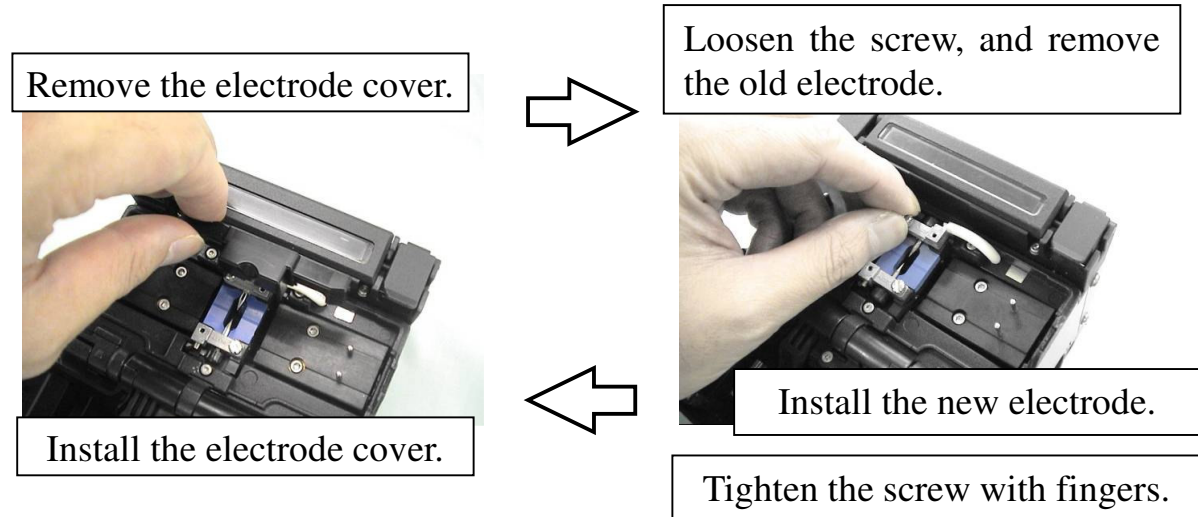
Electrodes wear with use and also must be cleaned periodically due to silica buildup. It is recommended that the electrodes be replaced after 1,000 arc discharges. When the number of arc discharges reaches a count of 1,000, a message prompting replacement of the electrodes is displayed immediately after turning on the power. Continuing to use the electrodes will result in greater splice loss and reduced splice strength.

Replacement Procedure

- (1) Execute [Replace Electrode] in [Maintenance Menu 1].
- (2) Instruction messages will appear on the screen to turn off the power. Press and hold  until the LCD turn off.
- (3) Remove the old electrodes.



- (i) Remove the electrode cover
 - (ii) Loosen screw located on electrode fixture.
 - (iii) Take the electrode from the V-groove.
- (4) Clean the new electrodes with alcohol-impregnated clean gauze or lint-free tissue and install them in the splicer.
- (i) Place the new electrode with the electrode collar lightly pressed against the V-groove.
 - (ii) Tighten the screw firmly with fingers, and install the electrode cover.



- Do not pull out wiring when replacing electrode.
- Tighten the screw firmly with fingers. Do not use a screw driver to tighten the screw.

- (5) Turn on the power. Set a 4 fiber ribbon in one side of the fiber holder, and perform stripping and cleaning. Without cleaving the fiber, set the fiber holder onto the splicer across both left and right V-grooves. Then press . After executing the arc calibration, the splicer will repeat the arc discharge 30 times in succession to stabilize the electrodes.

Replace Electrodes

Confirm that
new electrodes are
in proper position.

Prepare and put a
non-cleaved long
fiber across
the left and right
V-grooves.

: Execute
: Exit

- (6) Upon completion of repeated arc discharge, the splicer executes an arc calibration again. The operator should repeat arc calibration until the “Test Finished” message appears. For details of the arc calibration process, see page 42.

2. Stabilizing Electrodes

In the event of a sudden change in environmental conditions or after cleaning electrodes, the arc power sometimes becomes unstable, resulting in higher splice losses. When the splicer is moved from lower altitudes to higher altitudes, for example, it takes time for the arc power to stabilize. In this case, stabilizing electrodes will expedite the process of making the arc power stable. If more than 3 tests are required to get the “Test Finished” message appears in [Arc Calibration], use this function as well.

Operation Procedure

- (1) Set a 4 fiber ribbon in one side of the fiber holder, and perform stripping and cleaning. Without cleaving the fiber, set the fiber holder onto the splicer across both left and right V-grooves.
- (2) Press  and the splicer begins to stabilize the electrodes.
- (3) After completing stabilization, always perform an additional [Arc Calibration].

3. Clearing Arc Count

This function enables the stored number of arc discharges to be reset.

- (1) Select the [Arc Count Clear].
- (2) As the confirmation screen “Is it OK to clear?” appears, press  to clear.



- This function is included in the [Replace Electrodes] function.
- The number of arc discharges in the “Total Arc Count” field displayed on the [Maintenance Info.] screen cannot be reset.

4. Set Calendar

This function sets the date and time of the calendar in the splicer.

Operation Procedure

At the display for year, month, day, and time, press  to move the cursor to the parameters, and press  or  to adjust numerical values. After adjusting the calendar, press  to store the date and time.



5. Sensor Value

Displays the values measured by different sensors.

The value measured by the temperature sensor sometimes is higher than that of the ambient temperature due to self-heating of the splicer.

6. Diagnostic Test Function

The *SpliceMate*TM has a built in diagnostic test feature that allows the operator to perform a simple one step evaluation of splicer performance covering several different critical variables. Perform this function in the event of trouble with splicer operation.

Operation Procedure

(1) The following checks will be made.

	Check Item	Description
1	LED Check	Measures and adjusts the brightness of the illumination LED.
2	Motor Check	Check the Motor Limit Sensor.
3	Dust Check	Checks the optical path for dust or dirt and judges whether they disturb fiber observation. If contamination exists, this function indicates the location.
4	Motor Calibration	Automatically calibrates the motor speed.
5	Arc Calibration	Automatically calibrates the arc power factor and fiber splicing position.
6	I/O Port Check	Checks for normal operation of the input and output terminals of the internal circuit.
7	Memory Check	Checks the memory of the internal circuit.



- Before the start of the test, remove the fibers from the splicer.
- When item 3 (Dust Check) is completed, prepare and load the fibers into the splicer and press .

(2) Upon completion of all checks and adjustments, a list of results is displayed. If the splicer fails the dust check, clean the objective lenses. If cleaning does not eliminate contamination, there is a possibility that the contamination may have entered the inside optical path. Please contact your nearest sales agency for additional instructions.

The dust check functions exist as independent instructions in [Maintenance Menu].

7. Dust Check

During normal splicing, the splicer observes fibers through image acquisition and processing. Dust or contaminants on the cameras, lenses and wind protector LEDs disturb normal observation of fibers and may result in improper splicing. This function checks the optical path for the presence or absence of contaminants and judges whether they will cause trouble for fiber splicing.

Operation Procedure

- (1) If fibers are set in the splicer, remove them and press . The splicer begins the dust check.
- (2) The message “Now Checking” is displayed in the middle of the screen. After observation, the location of contamination judged as a potential problem blinks. If contamination is discovered, clean the wind protector LEDs and objective lenses and redo [Dust Check]. Refer to the section of [Maintenance of Splicing Quality] (Page 26) for cleaning instructions.



- If you have cleaned the objective lenses, and dirt or dust still remains, contact your nearest sales agency.

8. Motor Drive

The two motors in the splicer can be manually operated individually. During splicing, the motors can also be operated by calling this menu in the [PAUSE] or [FINISH] state.

- (1) Pressing  changes motor selection. The name of the selected motor is displayed in the upper section of the screen.
- (2) Press  (Forward)  (Backward) to drive the motor in the desired direction. When the motor reaches the limit of the operating range, the buzzer sounds and the motor stops. Press the opposite arrow key to reverse and move the motor again.



- Display messages can be erased by pressing . The message can be displayed by pressing  again.
- If you finish this operation by pressing , the motor will return to the reset position. To finish the operation with the motor held in the adjusted position, press .
- If the motor is moved too much with respect to the spliced fiber, the fiber may break.

9. Arc Discharge

The arc discharge in the splicer can be manually operated. During splicing, the arc discharge can also be operated by calling this menu in the [PAUSE] or [FINISH] state.

(1) Pressing , arc discharge is performed.

10. Maintenance Info

The following information is displayed.

Parameter	Description	
Serial Num.	Displays the serial number of the splicer.	
ROM Version	Displays the version number of the software.	
Arc Count	Displays the number of arc discharges since electrode replacement. Performing the function [Replace Electrodes] or [Arc Count Clear] resets this parameter to zero.	
Total Count	Displays the total number of arc discharges.	
Last Maintenance	Displays the date of last maintenance.	To enter the date, refer to [Other Option] (Page 55).
Next Maintenance	Displays the scheduled date of next maintenance.	

Error Message List

Press  when an error is shown on the monitor. The [HELP] screen displays the following:

- If an error does not have an error code, such as “Cleave Shape NG”, the keystrokes are displayed with information explaining what each keystroke does if pressed.
- If error has an error code, additional information according to the Error Code and Message is displayed.
- “NG” means “not good”.

Follow the solution precisely as shown in the list below. If it is not possible to eliminate the problem, the splicer may require service by a qualified service center. Consult your nearest sales agency with the following information:

- Model name of the splicer
- Serial number of the splicer
- Error message
- Error code (if shown)
- Situation when the error occurs

Error Code	Error Message	Reason	Solution
01	01 L-Too Long Fiber	• The fiber end-face is placed on the electrode centerline, or beyond it.	• Press  , and set the fiber end-face between the electrode centerline and the V-groove edge.
	10 R-Too Long Fiber	• The cleave length (bare fiber) is too long.	• Confirm the setting position of the stripped fiber end on the fiber cleaver. Check the cleave length.
	11 LR-Too Long Fiber	• Dust or dirt is on the objective lens or the wind protector LED.	• Execute the [Dust Check]. Clean the lens or the LED when dust or dirt exists.
02	01 X-Dark BackGround	Dust or dirt is on the objective lens or the wind protector LED.	Execute the [Dust Check]. Clean the lens or the LED if dust or dirt exists.
	10 Y-Dark BackGround		
	02 X-Dark BackGround	The LED or Camera might be damaged.	Consult your nearest sales agency.
	20 Y-Dark BackGround		

Error Message List

Error Code	Error Message	Reason	Solution
03	01 L-Too Dusty Fiber	- Dust or dirt is on the fiber surface. - Dust or dirt is on the objective lens or the wind protector LED. [Cleaning Arc] time is too short or "OFF."	- Completely prepare the fiber again (strip, clean and cleave). - Execute the [Dust Check]. Clean the lens or the LED if dust or dirt exists. - Set the [Cleaning Arc] time to ON or increase time.
	10 R-Too Dusty Fiber		
	11 LR-Too Dusty Fiber		
04	01 ZL Motor Overrun (Backward)	The taper speed or taper time is set too high.	Adjust the taper parameters in the splice mode.
	10 ZR Motor Overrun (Backward)	Only occurs in manual motor operation.	
	02 ZL Motor Overrun (Forward)	- The fiber is set too far back and does not reach the splice point. - The fiber is not set correctly at the bottom of the V-groove. The fiber is not located in the Camera's field of view.	- Press , re-position the fiber again with the end-face closer to the electrodes. - Press , and set the fiber again to seat it correctly at the bottom of the V-groove.
	20 ZR Motor Overrun (Forward)		
05	Cover Open	Unable to start splicing when the wind protector is open.	The splicer automatically starts splicing after closing the wind protector.
06	Cover Open	The wind protector is opened during splicing operation.	Press  after closing the wind protector.
07	01 ZL Motor Trouble	Motor might be damaged.	Consult your nearest sales agency.
	10 ZR Motor Trouble		
	11 ZL,ZR Motor Trouble		

Error Message List

Error Code	Error Message	Reason	Solution
08	01 L-Mismatch Fiber Count	Mis-selection of splice mode (number of fibers)	Select the appropriate splice mode.
	10 R-Mismatch Fiber Count		
	11 LR-Mismatch Fiber Count	Some fibers are broken.	Prepare the fiber (stripping, cleaning, and cleaving) again.
	- Mismatch Fiber Count (AUTO mode)		
09	01 Strong Arc Power	Unable to calibrate due to strong arc.	Replace the electrodes by using the [Electrode Replace] function. If this does not eliminate the problem, consult your nearest sales agency.
	02 Weak Arc Power	Unable to calibrate due to weak arc.	
	03 Too Left Arc	Unable to calibrate due to poor arc field position (too far left).	
	04 Too Right Arc	Unable to calibrate due to poor arc field position (too far right).	
10	Fiber Separation	The fiber stuff amount is insufficient.	If using the standard mode, check the [Overlap] setting in the splice mode.
		The pre-fuse power or pre-fuse time is set too high.	Check the [Prefuse Power] and [Prefuse Time] settings in the splice mode.
11	01	- The fiber is not set correctly at the bottom of the V-groove. - Large fiber offset	- Press , and re-position the fiber again to seat it correctly at the bottom of the V-groove. - Set the fibers again, or clean the V-groove.
	02	Bad Fiber Position - The cleave length (bare fiber) is too short. - The stripped fiber end is not proper position on the fiber holder.	- Confirm the setting position of the stripped fiber end on the fiber cleaver. Check the cleave length. - Place the fiber to proper position on the fiber holder.

Error Message List

Error Code		Error Message	Reason	Solution
12		No Arc Discharge	Arc Discharge did not occur.	• Assure the electrodes are in proper position. • Replace the electrodes. • Consult your nearest sales agency.
13	01	X-Camera Trouble	The Camera may be damaged.	Consult your nearest sales agency.
	10	Y-Camera Trouble		
	11	XY-Camera Trouble		

Error Message List

Error Message	Reason	Solution
Large Cleave Angle	Bad fiber end-face.	Check the condition of the fiber cleaver. If the blade is worn, rotate the blade to a new position.
	[Cleave Limit] is set too low.	Increase the [Cleave Limit] to an adequate limit.
Large Fiber Offset	Bad fiber end-face.	Check the condition of the fiber cleaver. If the blade is worn, rotate the blade to a new position.
	[Offset Limit] is set too low.	Increase the [Offset Limit] to an adequate limit.
Large Gap Different	Bad fiber end-face.	Check the condition of the fiber cleaver. If the blade is worn, rotate the blade to a new position.
	[Gap Dif. Limit] is set too low.	Increase the [Gap Dif. Limit] to an adequate limit.
Cleave Shape NG	Bad fiber end-face.	Check the condition of fiber cleaver. If the blade is worn, rotate the blade to a new position.
High Estimated Loss	Insufficient fiber cleaning.	Dust or dirt on the fiber surface results in high splice loss and low tensile strength. • Clean the fiber surface sufficiently. • Do not clean the fiber after cleaving to prevent dust on the fiber end-face. • Avoid any contact with the fiber end-face.
	Bad fiber end-face.	• Check the condition of fiber cleaver. If the blade is worn, rotate the blade to a new position. • Confirm the [Cleave Limit] setting. 5.0° or less is recommended.
	Dust or dirt is on the V-groove or the clamp chip.	Dust or dirt on the V-groove or clamp chip causes poor fiber movement during fiber stuffing. Clean them periodically.
	Dust or dirt is on the lens or LEDs	Execute the [Dust Check]. If dust or dirt exists, clean the lenses or LEDs.
	Bad electrode condition.	Replace the electrodes if they appear worn (rounded tip shape), dirty, or bent.
	Inadequate arc power.	Calibrate the arc power with the [Arc Calibration] function.
	Using unsuitable splice mode	Select a suitable splice mode for the fibers to be spliced.
	[Loss Limit] is set too low.	Increase [Loss Limit] to an adequate limit.
	Inadequate arc parameters in splice mode	If using a standard mode, confirm the arc parameters are adequate to splice the fibers.
	Inadequate estimating parameters in splice mode	If using the standard mode, confirm the estimating parameters are adequate to estimate the loss.

Error Message List

Error Message	Reason	Solution
Arc Discharge Delayed	Arc Discharge is delayed	• Check that the electrodes are in proper position. • Execute the [Stabilize Electrode] function. • Replace the electrodes.
Thin Fiber	Inadequate arc power	Calibrate the arc power with the [Arc Calibration] function.
	Prefuse power or time is set too high	If using the standard mode, adjust or initialize [Prefuse Power] or [Prefuse Time] settings. For AUTO splice mode, the prefuse is fixed and cannot be adjusted.
	Insufficient [Overlap] setting	If using the standard mode, adjust or initialize [Overlap] setting. For AUTO splice mode, the overlap is fixed and cannot be adjusted.
Fat Fiber	Too much [Overlap] setting	
Too Tapering Fiber	Too much fiber taper.	If using the taper splice function, the error message may appear meaning the fiber is tapered too much.
Bubble	Bad fiber end-face.	Check the condition of fiber cleaver. When the blade is worn, rotate the blade.
	Prefuse power or time is set too low	If using a standard mode, adjust or initialize [Prefuse Power] or [Prefuse Time] settings. For AUTO splice mode, the prefuse is fixed and cannot be adjusted.
There is dust after executing Dust Check function	Dirt or dust exists in optical path.	• Clean the objective lenses by referring page to 28. • When the above processes cannot remove the dirt or dust, consult your nearest sales agency.
Heater Oven Trouble	Heater does not heat.	Consult your nearest sales agency.
Temperature Sensor NG	Temperature Sensor may be damaged.	Consult your nearest sales agency.

Questions and Troubleshooting

1. Power Supply

(1) Power does not turn off when pressing

- Press and hold the key for 2 or 3 seconds.

(2) Few splices can be made with a fully charged battery pack

- If the power saving function is not enabled, the battery power degrades faster. Refer to [Power Save] (Page 52). Always enable it to conserve power usage.
- The battery pack has reached the end of its service life. Install a new battery pack.
- The battery pack uses a chemical reaction to produce power. The capacity decreases when it is exposed to lower temperatures, especially at lower than 0° C.
- At high altitude, the arc discharge current is increased. In this condition, battery power degrades faster due to larger power consumption.

(3) “POWER” LED on Battery Charger blinks during battery recharge

- Atmospheric temperature is too high (more than 40° C), or the battery pack is charged under exposure to sunlight.
- The battery pack has a fault or has reached the end of its service life. Install a new battery pack. If the LED blinks again after install, contact your nearest sales agency.

(4) Method to change the power saving function settings

- Refer to [Power Save] function on page 52.

(5) Battery indicator is not displayed / Power saving function does not work

- When using the AC adapter, the function does not work.
- Battery pack indicator on the battery pack does not work correctly.

(6) Incorrect indication of battery indicator

- The indicator display serves as a reference only.
- Battery Pack Indicator on the battery does not work correctly.

2. Splicing Operation

(1) Confirmation of splicing procedures

- Refer to [Splicing procedure] (Page 20).

(2) Error message appears on monitor

- Refer to [Error Message List] (Page 62).

(3) Inconsistent splice loss / High splice loss

- Clean the V-grooves, fiber clamps, wind protector LEDs, and objective lenses. Refer to [Maintenance of Splicing Quality] (Page 26).
- Replace the electrodes. Refer to [Electrode Replacement] (Page 28).
- Refer to the “High Estimated Loss” error message section in the [Error Message List] (Page 62).
- If the fiber has curl or bend memory, position the fiber so the crown (curve) of the memory is turned downwards.
- The splice loss varies according to the cleave angle, arc conditions and fiber cleanliness.
- If the splice loss is still too high or inconsistent after performing the above-mentioned remedies, contact your nearest sales agency. Regular service (at least once a year) is recommended to maintain high splicing quality.

(4) Monitor suddenly turned off

- The power saving function is automatically enabled when using a battery pack. The splicer switches to the power saving state after an extended period of splicer inactivity. Press any key to return to the normal state. To change the length of time before the splicer switches to the power saving state, refer to [Power Save] (Page 52).

(5) Splicer power suddenly turned off without “Low Battery” message

- The power saving function is automatically enabled when using a battery pack. The splicer turns the splicer power off after an extended period of splicer inactivity. Press  to turn on the splicer again. To change the length of time before the splicer turns the splicer power off, refer to [Power Save] (Page 52).

(6) Method to initialize arc condition of Splice mode

- Refer to [Editing a splice mode] (Page 34).

(7) Method to change error thresholds for Cleave angle, Splice loss, Gap and Axis Offset.

- Refer to [Editing a splice mode] (Page 34) when using an AUTO mode.
- Refer to [Editing a splice mode] (Page 34) when using a Standard mode.

(8) Error message can be over-ridden

- Refer to [Splice Option] (Page 44) to prevent error message override.

(9) Unable to change Arc Power and Arc Time

- The settings cannot be changed in AUTO modes.
- Performing [Arc Calibration] maintains adequate arc power in these modes.
- If using the standard mode, the Arc Power and Arc Time may be locked by administrator, preventing them from being changed.

Questions and Troubleshooting

(10) Method to set Pause and to display Cleave Angle, Gap Dif., and Offset

- Refer to [Splice Option] (Page 44).

(11) Mismatch between Estimated splice loss and Actual splice loss

- The estimated loss is a calculated loss, so it can be used for reference only.
- The optical components of the splicer may need to be cleaned.
- When using the standard mode, adjust [Est. Coef.] and [Minimum Loss]. To adjust these parameters, refer to the parameter settings of the other splice modes stored in the database area.

3. Tube-heater Operation

(1) Fiber protection sleeve does not shrink completely

- Extend the heating time. Refer to [Editing Heater Mode] (Page 40).

(2) Heater symbol on display blinks

- Pressing the  key during heating causes the symbol to blink. The tube heater is turned off if the HEAT key is pressed again. If 2 seconds have gone by without pressing the HEAT key again, the symbol stays on continuously and the heater returns to its normal state. The symbol will disappear when the heat cycle is completed.
- If the heating temperature does not reach its desired setting, the symbol blinks and the alarm sounds. If this happens, contact your nearest sales agency.

(3) Fiber protection sleeve adhered to heating plate after shrinking

- Use a cotton swab or a similar soft tip object to push and remove the sleeve.

(4) Method to initialize heating condition of Heater mode

- Refer to [Editing Heater Mode] (Page 40).

(5) Method to cancel heating process

-  does not cancel the heater. Press  twice to cancel the heating process.

4. Supervising

(1) What functions can be disabled

- Refer to [Menu Lock] (Page 53).

(2) Method to lock “selection” or “editing” of Splice or Heater mode

- Refer to [Menu Lock] (Page 53).

(3) Method to set parameters of Splice or Heater mode from a PC

- To set or change the parameters, contact your nearest sales agency.

(4) Forgot password

- Contact your nearest sales agency.

5. Other Functions

(1) Method to execute [Dust Check] automatically after turning power on

- Refer to [Power On Option] (Page 54).

(2) Method to hide messages on [READY] screen

- Change the fiber image from X/Y view by pressing .

(3) Too many repetitions until “Test Finished” indicated in [Arc Calibration]

- The splicer needs to repeat the arc calibration after replacing the electrodes or when the environmental conditions change drastically. (Page 55). The number of arc calibrations can be set to a specific amount. When the splicer completes the set amount of calibrations, it indicates “Test Finished”. However, this does not mean it is completely calibrated.

(4) “Test Finished” is never indicated after many repetitions in [Arc Calibration]

- Execute [Stabilizing Electrodes] function in [Maintenance Menu]. If the splicer still does not indicate “Test Finished”, replace the electrodes. Refer to [Replace Electrode] section.

(5) No arc power change after [Arc Calibration]

- An internal factor is calibrated and adjusted for the specific arc power selected. The displayed arc power in each splice mode does not change.

(6) Method to input different comments after each splice in splice results data

- Refer to [Splicing procedure] (Page 20).

(7) Method to input the same comments automatically in splice results data

- Refer to [Splicing procedure] (Page 20).

(8) Method to cancel storing splice results in internal memory

- Refer to [Splicing procedure] (Page 20).

(9) Method to download splice results from splicer to PC

- Contact your nearest sales agency.

Guarantee and Contact Address

1. Guarantee

1. Guarantee period and limits

If the splicer becomes out of order within one year from the date of delivery, we will repair it free of charge. However, note that repairs will be charged for the following cases regardless of the guarantee period:

- (1) Trouble or damage due to natural disaster.
- (2) Trouble or damage due to mishandling.
- (3) Trouble or damage due to handling in disregard of the operating procedures or instructions described in the instruction manual.
- (4) Consumable items (discharge electrodes etc.)
- (5) Trouble or damage due to abnormal voltage supply.

Most cases of damage to the AC adapter from an abnormal power supply occur within the warranty period. The specification of AC input voltage is up to AC240V (340V-peak). For this reason, Fujikura Ltd. will provide a warranty replacement of the AC adapter only one time. In a second AC adapter is damaged during the warranty period, Fujikura Ltd. will not replace it free of charge.

2. Before shipping the splicer

Please consult your nearest sales agency first.

3. Necessary information needed for repair

Include documentation with the splicer informing us of the details listed below.

- (1) Your full name, section, division, company, address, phone number, fax number and e-mail address.
 - (2) Model name and serial number of the splicer.
 - (3) Problems encountered
 - What problems did your splicer exhibit and when?
 - What is its present operational state?
 - The state of the monitor and the contents of the relevant error message.
- etc.

4. Transporting the splicer

Since the splicer is a high-precision machine, always use the original carrying case for transportation and storage in order to protect it against humidity, vibration and shock. When requesting splicer repair, please send the splicer, along with its accessories, in its original carrying case.

5. Note for Repair

Please note the memory contents, such as splicing results, splice mode, etc., may be lost depending on the kind of repair.

2. Contact Address

Inquiries concerning products should be made to the nearest sales agency or one of the following:

Fujikura Europe Ltd.
C51 Barwell Business Park
Leatherhead Road, Chessington, Surrey KT9 2NY
England
Tel. +44-20-8240-2000 (Service: +44-20-8240-2020)
Fax. +44-20-8240-2010 (Service: +44-20-8240-2029)
URL <http://www.fujikura.co.uk>

Alcoa Fujikura Ltd.
260 Parkway East
Duncan, SOUTH CAROLINA 29334
U.S.A.
Tel. +1-800-AFL-FIBER (Service: +1-800-866-3602)
Fax. +1-864-433-5560 (Service: +1-800-433-5452)
P.O.Box 3127 Spartanburg, SC 29304-3127
URL <http://www.aflfiber.com>

Fujikura Asia Ltd.
460 Alexandra Road #22-01 PSA Building
Singapore 119963
Tel. +65-6-2711312 Fax. +65-6-2780965
URL <http://www.fujikura.com.sg>

Fujikura Ltd.
Optical Fiber & Equipment Department
International Sales & Marketing
1-5-1 Kiba, Koto-ku, Tokyo 135-8512
Japan
Tel. +81-3-5606-1164 Fax. +81-3-5606-1534
URL http://www.fujikura.co.jp/front_e.htm

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